Vol. 890 Number 3

OFFICIAL GAZETTE

of the UNITED STATES PATENT OFFICE

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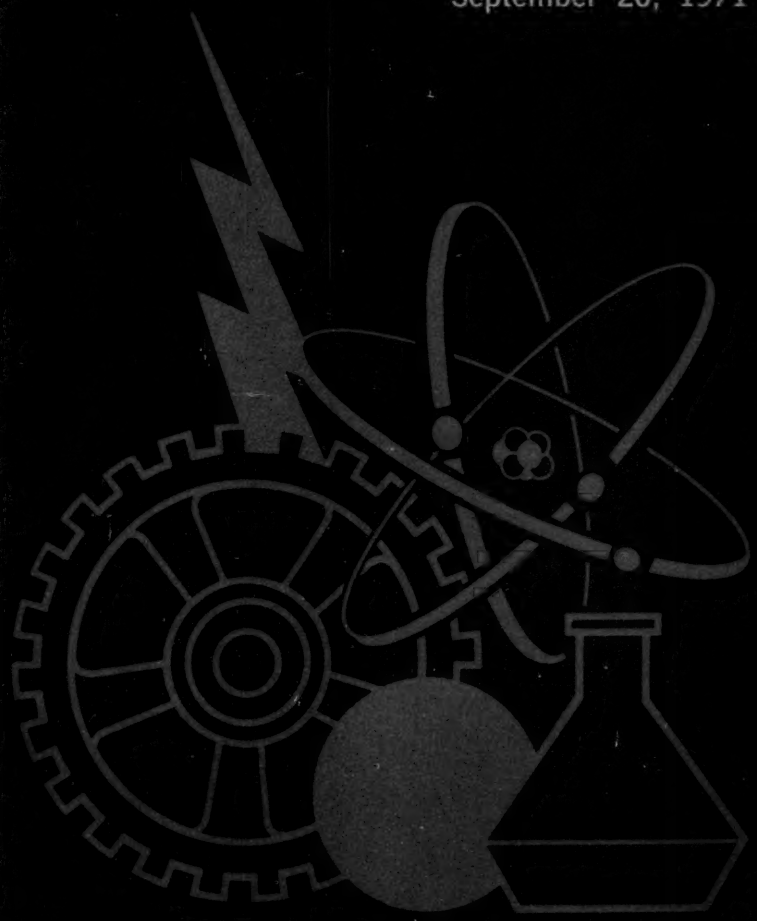
PATENTS

September 20, 1971



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Patent Office

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

September 20, 1971 Volume 890 Number 3

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PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 24, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
* Date of Oldest Application (New)	
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-04-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	*3-05-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-15-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-24-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	12-11-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	*3-23-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-14-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-18-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	5-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	8-06-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-06-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	*5-14-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-04-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	9-11-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	7-10-70

Expiration of patents: The patents within the range of numbers indicated below expire during August 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,685,085 to 2,688,132, inclusive
Plant Patents..... Numbers 1,294 to 1,299, inclusive

REISSUES

SEPTEMBER 20, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,168
AUTOMATIC BRAKE CONTROL SYSTEM

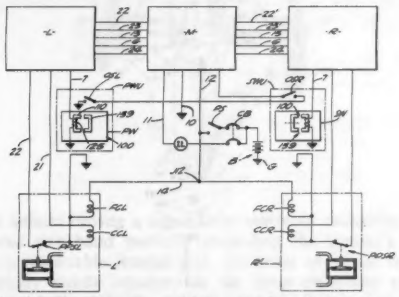
Bernard B. Thompson, Bainbridge Island, Wash., Donald J. O'Connell, deceased, late of Pacoima, Calif., by Frances M. O'Connell, administratrix, Mission Hills, Calif., assignors to Crane Co., Chicago, Ill.

Original No. 3,245,213, dated Apr. 12, 1966, Ser. No. 217,509, July 25, 1962. Application for reissue Feb. 7, 1967, Ser. No. 642,610

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 37 Claims



A braking system for vehicle wheels utilizing the rotational speed of the most rapidly rotating wheel to furnish a comparison standard governing the application of braking effort to the wheels. The system includes means for withholding this comparison standard from a locked or skidding wheel and operates to apply decreasing braking effort to any wheel rotating at a speed less than that of the fastest rotating wheel. If all wheels decelerate too rapidly, a memory or reference means initiates relaxation of all brakes until some wheel attains a speed approaching the fastest wheel speed just prior to skidding.

Rotational wheel speeds are sensed by transducer means operatively associated with the respective braked wheels and including a coil energized by D.C. which is modulated by A.C. generated as the wheel rotates and having a frequency proportional to rotational speed. A wave potential, preferably of square wave form, produced therefrom is employed, in the case of the fastest rotating wheel, to charge capacitive means to a potential representing the rotational speeds of the respective wheels and which potential is permitted to decay at a desired rate such as the fastest normal deceleration rate selected as optimum for that vehicle. An output signal to brake application control means is produced which is inversely proportional to the frequency of the speed signal sensed for the associated wheel and this signal is employed to relax the brake to an extent proportional to the magnitude of the output signal thereby permitting the wheel to recover from an overbraked condition.

27,169
REFUSE GATHERING MACHINE

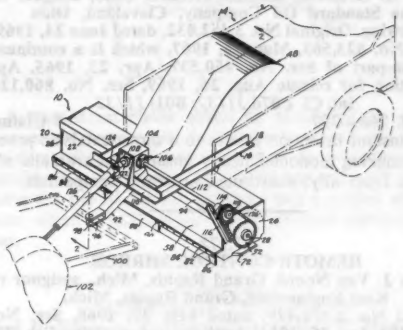
Herbert O. Vinyard, Rte. 2, Box 75H, Hammond, La. 70401

Original No. 3,348,652, dated Oct. 24, 1967, Ser. No. 544,600, Apr. 22, 1966. Application for reissue Oct. 8, 1969, Ser. No. 870,517

Int. Cl. B65g *31/04, 65/06*

U.S. Cl. 198—7 18 Claims

A refuse gathering machine comprising an open bottom horizontal housing, an upwardly directed inclined chute leading from said housing and communicating with a central portion of the interior thereof, the upper and lower walls of said chute penetrating within said housing in curved lower portions while the sidewalls of the chute terminate at the housing without entrance, a conveyor shaft extending the length of the housing and having oppositely turned conveyor screw portions at its ends and a thrower rotor at its center including a pair of blades lying in planes parallel to the shaft and having outer free edges which pass said curved lower portions of the chute walls with wiping tolerance, said conveyor screw portions serving to move refuse toward the center of the shaft when it is rotated and said thrower rotor serving to throw material upwardly through the chute to a receiver.



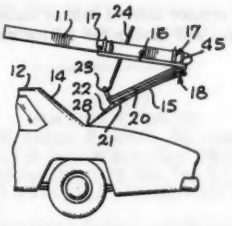
27,170
UTILITY CARRIER FOR VEHICLES

Leslie E. Porter, Oakdale, Calif., assignor of fractional part interest to Philip P. Pendergrass, Oakland, Calif.

Original No. 3,333,750, dated Aug. 1, 1967, Ser. No. 558,032, June 16, 1966. Application for reissue June 30, 1969, Ser. No. 870,174

Int. Cl. B60r *9/04*

U.S. Cl. 224—29R 12 Claims



A utility carrier for mounting equipment to be transported arranged to be mounted on the trunk lid of a vehicle and adapted to rotate about the hinge axis of the

lid comprising a bottom section adapted to be secured directly on the trunk lid; a top section for mounting the equipment, the top section being hingeably coupled at one end thereof to the bottom section whereby the opposite end of the top section is pivotable between a stored position substantially adjacent the bottom section and an elevated position disposed at a substantial tilting angle with respect to the bottom section; and means extendable between the sections for releasably coupling the bottom section and the top section and for supporting the top section in its elevated position so that the trunk lid may be rotated in a manner to provide sufficient clearance between the equipment carried on the top section and portions of the vehicle.

27,171

METHOD FOR THE PRODUCTION OF CERTAIN AROMATIC AND HETERO-AROMATIC ALDEHYDES

Robert K. Grasselli, Garfield Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

No Drawing. Original No. 3,452,032, dated June 24, 1969, Ser. No. 623,563, Mar. 16, 1967, which is a continuation-in-part of Ser. No. 450,537, Apr. 23, 1965. Application for reissue Aug. 25, 1969, Ser. No. 860,126

Int. Cl. C07d *31/32*; B01j *11/32*

U.S. Cl. 260—297 **9 Claims**

The instant invention relates to a direct-catalytic process for making monoolefinically unsaturated aromatic aldehydes from allyl substituted aromatic compounds.

27,172

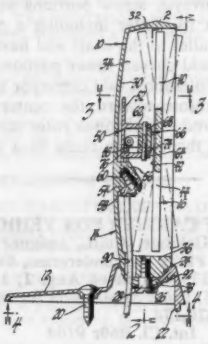
REMOTE CONTROL MIRROR

Andrew J. Van Noord, Grand Rapids, Mich., assignor to Kent Engineering, Grand Rapids, Mich.

Original No. 3,370,479, dated Feb. 27, 1968, Ser. No. 338,892, Jan. 20, 1964. Application for reissue Feb. 27, 1970, Ser. No. 15,306

Int. Cl. F16c *1/10*

U.S. Cl. 74—501M **21 Claims**



A two-wire remote control mirror including a housing on a swivel base and having the mirror mount secured to the inside back wall of the housing from under the front edge of the mirror as tilted back for such purpose.

27,173

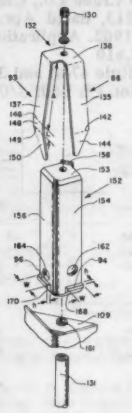
REACTOR DEVICE

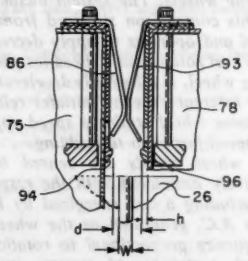
James Lloyd Lass and Carl Raymond Mefford, San Jose, Calif., assignors to General Electric Company

Original No. 3,338,791, dated Aug. 29, 1967, Ser. No. 461,870, June 7, 1965. Application for reissue May 29, 1969, Ser. No. 835,291

Int. Cl. G21c *3/32*

U.S. Cl. 176—66 **10 Claims**





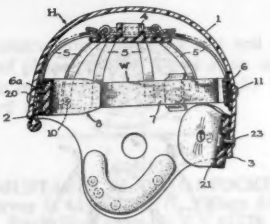
A fuel bundle comprising fuel material disposed in an elongated channel, a spring assembly connected to one end of said channel, said spring assembly having a first member and a second spring member, each of said first and second spring members extending generally parallel to the other surface of the end of said channel, said first spring having a knee portion and said second spring members having a flat section.

PATENTS

GRANTED SEPTEMBER 20, 1971

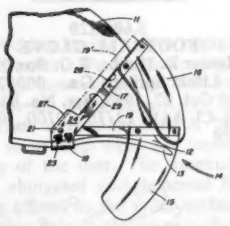
GENERAL AND MECHANICAL

3,605,113
PROTECTIVE HEADGEAR
Charles Wayne Marietta, 5538 University Blvd., Dallas, Tex.
Filed May 5, 1969, Ser. No. 821,666
Int. Cl. A42b *1/08*
U.S. Cl. 2—3 **11 Claims**



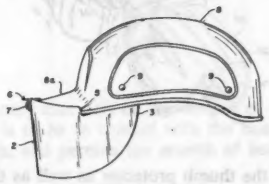
A helmet having a suspension assembly including both a head size band partially encircling the wearer's head and a removable frontal pad, the latter of which is substantially rigidly attached to the inner periphery of the helmet shell while the former is suspended in a manner isolated from the shell inner periphery.

3,605,114
PROTECTIVE EYESHIELD FOR HELMETS
Stuart L. Hanlein, College Park, Md., and John F. Quinlan, Jacksonville, N.C., assignors to the United States of America as represented by the Secretary of the Navy
Filed Apr. 6, 1970, Ser. No. 25,941
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **5 Claims**



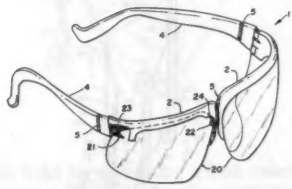
An eyeshield assembly detachably securable to the brim of a helmet. The assembly includes a fixed support bracket having screw clamps on each end for engagement with the brim of a helmet and a movable bracket pivotally mounted upon the fixed support bracket. A transparent shield is mounted on the movable support and may be lowered to a eye-shielding position or raised to a retracted position out of the line-of-sight of the wearer and beneath a protective cover which is mounted on the fixed support bracket to protect the transparent shield against becoming scratched while not in use.

3,605,115
SHIELD
William R. Bohner, Reading, Pa., assignor to ESB Incorporated, Philadelphia, Pa.
Filed Sept. 10, 1969, Ser. No. 856,649
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **4 Claims**



A transparent plastic shield for protecting the eyes or face of the wearer and having hook shaped ends which are detachably secured to the anchors for a headband suspension in a safety cap. The shield has a cut-out portion along the top of the side portions and a central stop element which is held on the top of the brim portion of the cap.

3,605,116
INDUSTRIAL SPECTACLES
Jack N. Simpson, Sinking Spring, George R. Hoffmaster, Reading, and Palmer E. Brace, Mohnton, Pa., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Feb. 27, 1968, Ser. No. 708,594
Int. Cl. A61f *9/02*
U.S. Cl. 2—14R **5 Claims**

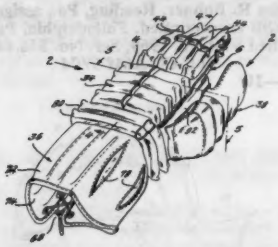


Spectacles, such as industrial spectacles and sunglasses, having embedded in the nose piece a malleable insert to permit slight bending, horizontally, with a permanent set of the two lens surrounding portions, either toward or away from the face, so as to adjust the frame to the facial contour of the wearer. Such insert may also be embodied in each temple. The nose piece insert when twisted vertically also permits adjustment of the temple extremities so that they may be brought into horizontal alignment.

3,605,117
HOCKEY GLOVES
Roland N. Latina, Belleville, Ill., assignor to A-T-O Inc., Willoughby, Ohio
Filed Jan. 30, 1970, Ser. No. 7,131
Int. Cl. A61d *13/10, 19/00*; A61f *9/00*
U.S. Cl. 2—16 **12 Claims**

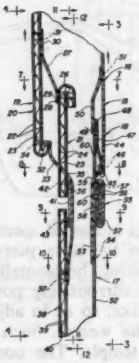
A hockey glove has a hand receiving portion which is adapted to receive and envelope the user's hand. That portion includes an open-ended palm area and thumb and

finger stalls which open into the palm area. A padded back portion overlies the palm area and finger stalls and is connected to the ends of the finger stalls and to the outer side of the palm area, but otherwise remains detached from the hand receiving portion. A padded thumb protector overlies the thumb stall, but is connected thereto only through a connecting flap extending from and beyond the end of the thumb stall. The rear ends of the back



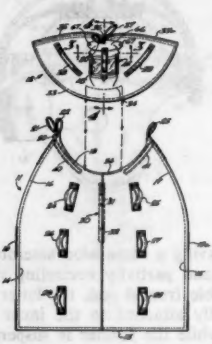
portion and the thumb protector as well as the open end of the hand receiving portion are all connected to a padded arm guard in the vicinity of the user's wrist so that the arm guard encircles the user's forearm. Since the hand receiving portion is for the most part detached from the overlying back portion and thumb protector, it is extremely flexible, affording the user a high degree of control over a hockey stick.

3,605,118
GARMENT
Jacob A. Elin, 400 E. Randolph St., Chicago, Ill. 60601
Filed July 11, 1969, Ser. No. 841,089
Int. Cl. A41d *13/02*
U.S. Cl. 2—79 **15 Claims**



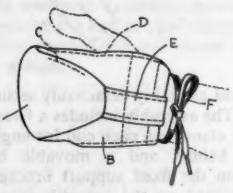
A close-fitting, neat, attractive and warm garment for use as a work suit, ski suit, hunting suit, sports suit, bobsledding suit, snowmobile suit, and the like, which includes a blouse or jacket portion and a trousers portion. The blouse or jacket portion and the trousers portion of the garment each include a flexible fabric outer liner component and flexible, warm, heat-insulating inner liner component. A first flexible elastic means is provided for interconnecting the blouse or jacket portion to the trousers portion of the flexible, warm, heat-insulating inner liner component of the garment and a second flexible, elastic means is provided for interconnecting the blouse or jacket portion and the trousers portion of the flexible elastic outer liner component of the garment so that in use both the flexible, warm, heat-insulating inner liner component and the flexible, fabric outer liner component of the garment will expand or yield to conform to the needs and requirements of the wearer when the wearer moves forwardly or sidewise from a normal upright position and without binding of the garment or discomfort to the wearer.

3,605,119
COMBINATION BODY COVER AND STRETCHER
Roy L. Cherry, 15205 NE. 6th Ave., Miami, Fla. 33161
Filed July 20, 1970, Ser. No. 56,355
Int. Cl. A41d *3/08*
U.S. Cl. 2—88 **8 Claims**



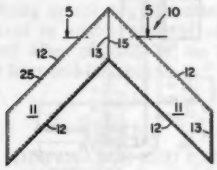
A combination body cover and stretcher is described including a hooded fire-resistant cape adapted to be wrapped around an incapacitated fire victim at the scene of a fire in such a way that his entire body is protected until he can be carried to safety. The cape is provided with handle grip means along each side for use in transporting the covered victim as if he were on a stretcher. The hood has a liftable visor permitting exposure of the face for administrating oxygen, performing resuscitation procedures and the like life-saving operations without the necessity of removing the entire hood.

3,605,120
FOOTBALL GLOVE
Homer B. Hobbs, P.O. Box 323, Lithia Springs, Ga. 30057
Filed Oct. 27, 1969, Ser. No. 869,827
Int. Cl. A41d *13/10, 19/00, 19/02*
U.S. Cl. 2—159 **2 Claims**



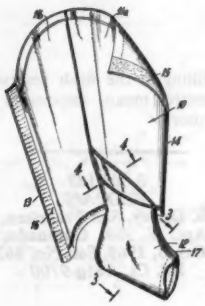
An athletic glove for holding the fingers of football players closed to encourage proper tackling includes a finger receiving pocket which is maintained in folded position with a free forward end folded back adjacent a front portion covering the palm.

3,605,121
SCARF CONSTRUCTION
Mary Suzuki, 36 W. 84th St., New York, N.Y. 10024
Filed Dec. 4, 1969, Ser. No. 882,253
Int. Cl. A42b 5/00
U.S. Cl. 2—207 1 Claim



A scarf construction comprising first and second elongate panels of pliant material joined at an angle with respect to each other to form a substantially V shaped or chevron scarf construction.

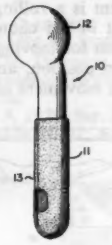
3,605,122
ADJUSTABLE ELASTIC STOCKING
Harvey L. Myers, 885 N. Village Ave., Rockville Centre, N.Y. 11570
Filed Feb. 28, 1969, Ser. No. 803,286
Int. Cl. A41b 11/00
U.S. Cl. 2—239 1 Claim



An elastic stocking having a foot engaging portion and a leg engaging portion. The foot engaging portion is constructed to permit insertion of the foot therethrough and is attached to the leg engaging portion. The leg engaging portion comprises a member having two longitudinal edges adapted to overlap when the member is wrapped around the leg of the user. The longitudinal edges are provided with elongated complemental fastening strips, one strip being affixed to the inner surface of the member, and the other strip to the outer surface of the member.

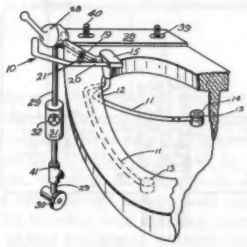
3,605,123
BONE IMPLANT
Henry Hahn, Fairfax, Va., assignor to Melpar, Inc., Falls Church, Va.
Filed Apr. 29, 1969, Ser. No. 820,184
Int. Cl. A61f 1/22
U.S. Cl. 3—1 31 Claims

A permanent implant for bone tissue which has a dense cast or wrought base portion of high strength metal, and a porous metal layer overlying and bonded to the base portion. The porous layer is thin in comparison with the thickness of the base portion and is preferably plasma flame coated on the base portion. The shape of the base portion depends upon the specific requirements of the bone tissue it is to replace or repair. The porous layer



may cover only that part of the surface of the base portion which is to be in contact with the bone tissue after implantation, and permits the growth of bone tissue into the pores.

3,605,124
PORTABLE BIDET
Henry G. Marcard, 8409 Brimfield St., Panorama City, Calif. 91402, and Carlos A. Vincenzi, 13430 Burbank Blvd., Van Nuys, Calif. 91401
Filed Sept. 18, 1969, Ser. No. 858,962
Int. Cl. E03d 9/08
U.S. Cl. 4—7 18 Claims

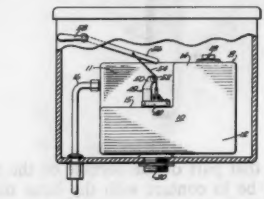


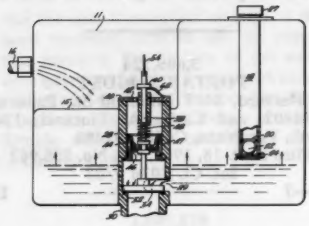
A portable bidet for converting a flush toilet to a bidet, the bidet having a fluid delivery pipe rotatably connected to a pivot valve, the fluid delivery pipe adapted to rotate from its inactive position adjacent the internal rim of the toilet bowl to its operating position in the center of the bowl. A positioning means actuated by a flow of water, and adapted to automatically rotate the fluid delivery pipe to its operating position. A heater and thermostatic valve are provided to heat the water and provide an aromatic toilet bowl cleaning device.

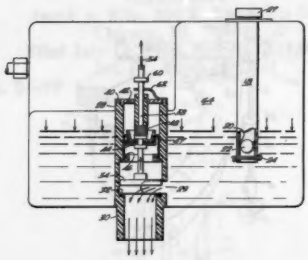
3,605,125
HYDRAULIC TANK ASSEMBLY FOR A WATER CLOSET
James W. Gibbs, 8027 W. 14th Ave. 33110, and John L. Gibbs, 14820 Miami Lakeway E. 33114, both of Hialeah, Fla.
Filed Mar. 23, 1970, Ser. No. 21,760
Int. Cl. E03d 3/00, 5/00, 11/00
U.S. Cl. 4—26 4 Claims

A hydraulic assembly for filling and rapidly discharging a liquid from a hermetically sealed tank. Vertically positioned in the tank is a chute having an open lower

end and a closed upper end and having an aperture opening into the lower portion of the tank. A valve seat extends around the inner periphery of the chute positioned below this aperture, while positioned within the chute is a valve head with a stem. The valve head is capable of vertical movement from an open position above the aperture to a closed position in sealed engagement with the seat. On the valve stem is a rolling diaphragm disposed for vertical movement in the chute. Manual means are associated with the stem for moving the valve head from the closed to the open position, and spring means, normally resisting upward movement of the valve head when



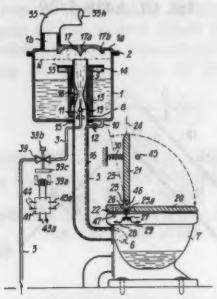


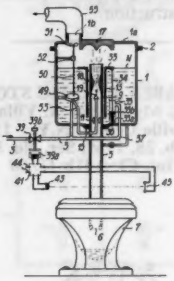


the valve head is seated, are disposed above the rolling diaphragm around said stem. There is also an air vent and check valve passing through the tank. The check valve moves to a closed position when liquid in the tank rises to a predetermined level and falling to open the vent to the atmosphere when liquid falls below this level. Pressurized water is supplied into the tank by an inlet conduit. Operation of the manual means will open the valve head, forcing the liquid to flow through the aperture and outwards from the cylinder, the flow thereof being augmented by compressed air pressure acting to rapidly force liquid through the aperture and out of the cylinder.

3,605,126
WATER CLOSET INSTALLATION
Georges A. Henry, 19 Rue Folletiere, Draguignan, France
Filed Mar. 3, 1970, Ser. No. 16,127
Claims priority, application France, Mar. 5, 1969, 6,064
Int. Cl. E03d *9/04, 9/05, 11/02*
U.S. Cl. 4—72 **10 Claims**

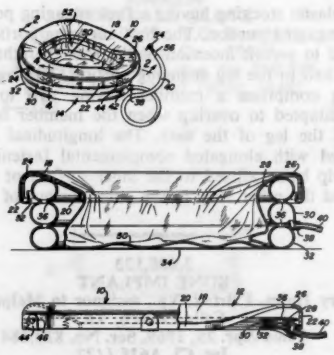
A combined water-flush and air-blast system for a water closet installation. The flush pipe connecting the flush reservoir to the commode of the water closet is used as an air-suction pipe. The air-suction means is supplied by the





water used for filling-in the flush reservoir. The system is actuated by control means responsive to the presence and absence of a user.

3,605,127
BEDPAN
Helen B. Dailey, San Francisco, Calif. (1417 2nd St., Apt. F 309, Coronado, Calif. 92118)
Filed Oct. 3, 1969, Ser. No. 863,554
Int. Cl. A61g *9/00*
U.S. Cl. 4—112 **2 Claims**



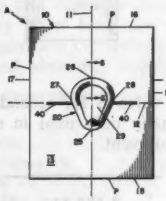
A bedpan employing a rigid annular seat and an inflatable annular member underlying the seat whereby the combined seat and inflatable member have only the combined vertical dimension of the seat when the inflatable

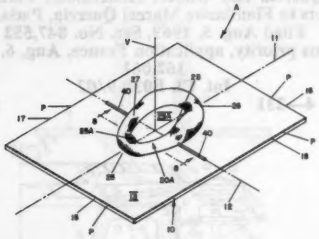
member is uninflated thereby enabling the bedpan to be easily placed under a patient after which the inflatable member is gently inflated to provide adequate space to conveniently receive three to four quarts of waste material, liquid or the like. The annular inflatable member has a bottom member attached thereto and a liner is provided for the interior of the cylindrical member as well as the bottom with the liner extending in overlying relation to the seat and being detachably connected to the external periphery thereof to enable removal of the liner along with its content after removal of the bedpan for easy disposal of the liner and its contents.

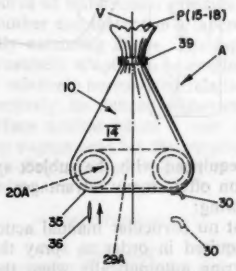
3,605,128
DISPOSABLE BED PAN

Merton E. Oden, 810 W. 11th St., Wahoo, Nebr. 68066, and John J. Forman, 7723 Lafayette St., Omaha, Nebr. 68114

Filed June 1, 1970, Ser. No. 42,282
Int. Cl. A61g *9/00*
U.S. Cl. 4—113 **16 Claims**





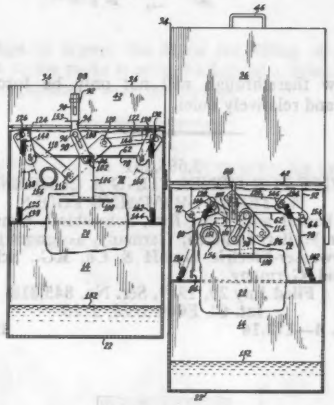


A single use disposable bed pan commercially suppliable as a compact package and comprising a thin flexible sheet-like base member having a lower surface adapted to be horizontally positioned upon the bed linens, together with a fluid inflatable annular tube superimposed upon and annularly attached to the base member whereby the inflated tube central opening provides a receptacle for body wastes. The entire bed pan and collected wastes are wholly conveniently disposable in a sack-like form through water sewer systems, incineration, chemical treatment tanks, or the like.

3,605,129
CHEMICAL TOILET

Francis L. Ellis, John H. Thornton, and B. Frank Inman, Jacksonville, Fla., assignors to Duval Chemical Toilets, Inc., Jacksonville, Fla.

Filed Apr. 9, 1970, Ser. No. 26,939
Int. Cl. A47k *11/02*; A61l *11/00*
U.S. Cl. 4—115 **17 Claims**



A self-contained chemical toilet for vehicular use having a toilet seat pivotally mounted to a housing and surroundingly positioned over an opening in the top wall, and a cover assembly pivotally mounted to the housing to cover the seat, opening and top wall. A pair of door members are respectively mounted to each of a pair of rods within the housing with the door members being pivotal from a closed horizontal position between the solution and the opening to an opened vertical position extending downwardly toward the chemical solution to baffle same during vehicular movement. A passageway member is attached to the housing top wall and depends downwardly into the interior thereof for sealingly engaging the door members when in their closed position to prevent splash-up of the solution onto the toilet seat and top wall. Linkage means extend between the cover assembly and each rod which is operable to pivot the rods and attached door members into their open position upon opening of the cover assembly and into their closed position on closing of the cover assembly. A counter records the number of times the cover assembly is opened for use of the toilet.

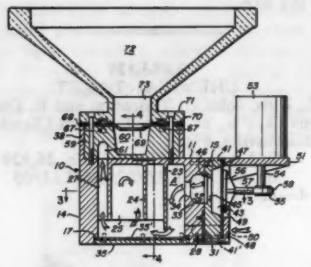
3,605,130
TOILET BASE

Linus E. Russell, Springfield, Ohio, assignor to Peters and Russell, Incorporated, Springfield, Ohio

Filed Aug. 2, 1968, Ser. No. 749,882
Int. Cl. E03d *5/01*
U.S. Cl. 4—90 **24 Claims**

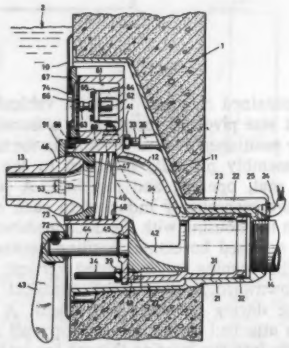
A toilet featuring a uniquely chambered base enabling a most compact toilet installation, the base being so formed to per se serve as a highly effective medium for directing water to flow to and from a toilet bowl in a

manner to provide for an efficient disintegration and discharge of contained waste. The base construction is such



that flow therethrough will not only be forceful but smooth and relatively quiet.

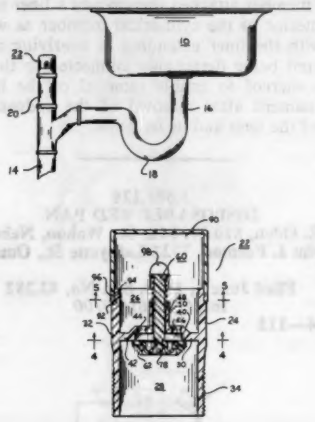
3,605,131
DEVICE FOR GENERATING A CURRENT OF WATER IN SWIMMING POOLS
Rudolf Brazel and Ernst Ritz, Schwabisch Gmund, and Elmar Weller, Lindach, Germany, assignors to UWE-Unterwasser-Electric GmbH & Co. KG., Schwabisch Gmund, Germany
Filed July 29, 1969, Ser. No. 845,818
Int. Cl. E04h *3/18, 3/20*
U.S. Cl. 4—172.16 **12 Claims**



A housing is mounted in a shell secured in the wall of a swimming pool and has a swingable nozzle for connection with a source of water under pressure to provide a water jet in the pool which can be turned on or off by a handle on the housing and may permit the introduction of admixed air into the jet stream.

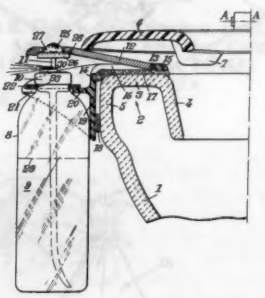
3,605,132
AUTOMATIC PLUMBING VENT VALVE
John F. Lineback, 801 Emerson, South Bend, Ind. 46615
Filed July 22, 1969, Ser. No. 843,341
Int. Cl. E03d *9/04*
U.S. Cl. 4—211 **5 Claims**

An automatic plumbing reventing valve having a body constructed of plastic material and defining an inlet and outlet chamber with a partition therebetween. The partition includes a transversely extending valve seat and holes therethrough in the confines of the valve seat. A valve element having a generally disc-shaped configuration seats on the partition and is lightly urged to its seat by a spring member operating on a stem extending through



the partition. The valve is for secondary plumbing vent risers and is normally only used in conjunction with a system having a main vent.

3,605,133
SPRAYING DEVICES CAPABLE OF BEING MOUNTED ON A LAVATORY PAN
Marcel Quercia and Gilbert Andermont, Paris, France, assignors to Flaminaire Marcel Quercia, Paris, France
Filed Aug. 5, 1969, Ser. No. 847,552
Claims priority, application France, Aug. 6, 1968, 162,061
Int. Cl. E03d *9/02*
U.S. Cl. 4—231 **10 Claims**

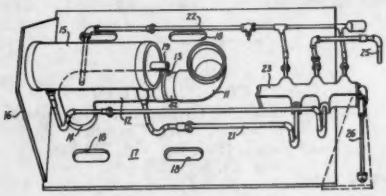


A lavatory equipped with the subject spraying device of this invention offers many advantages, the main ones being the following:

The fact that no particular manual action, notably on the seat, is required in order to spray the liquid, such spraying occurring automatically when the person rises from the seat, there being nothing to stop the seat from being raised into a vertical position.

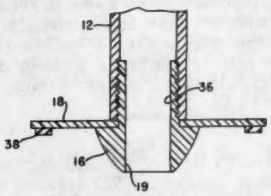
The fact that the invention can be applied to most existing lavatories without the need to modify them in any way, since the spraying device and its supporting member in particular serve to restrain the bottle containing the liquid, while the actuating lever can adapt to widely differing lavatory pan shapes, including pans with acutely curved surfaces.

3,605,134
HYDRAULIC CLOSET AND SINK ELEVATOR
Floyd F. Haering, Minneapolis, Minn., assignor to American Sterilizer Company, Erie, Pa.
Filed Oct. 14, 1969, Ser. No. 866,330
Int. Cl. E03d 11/00
U.S. Cl. 4—252 4 Claims



This disclosure describes a water closet support on which a water closet may be mounted. The water closet may be adjusted up and down by means of a hydraulic cylinder actuated by water from the water supply line. The closet and support are particularly suited for use by elderly, pediatric and physically impaired patients.

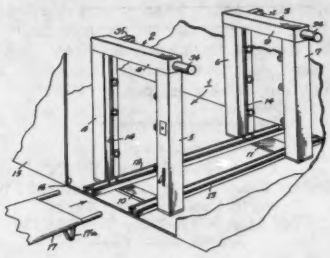
3,605,135
DRAIN FLUSHER
Louis P. Tan, 57 Walnut St., Lackawanna, N.Y. 14218
Filed Sept. 11, 1969, Ser. No. 857,007
Int. Cl. E03d 3/00
U.S. Cl. 4—256 1 Claim



A device for unclogging drains by means of water under pressure including a flexible hose connectible at one end thereof to a source of water under pressure and terminating adjacent another end thereof in a tapered seat bounded by a radially extending flange. The tapered seat and flange are alternatively adapted to be employed to provide a fluid seal for relatively narrow and relatively wide drain openings, respectively; the flange in either case providing a convenient surface against which a user may place his hand in bearing engagement for the purpose of maintaining the device in fluid sealing engagement with respect to the drain opening.

3,605,136
POWERED LITTER RACK
Jules A. Vichness, Newport News, and Richard E. Lane, Williamsburg, Va., assignors to the United States of America as represented by the Secretary of the Army
Filed Oct. 27, 1969, Ser. No. 869,573
Int. Cl. A47c 17/40; A61g 7/00
U.S. Cl. 5—8 6 Claims

A powered litter rack for quickly loading wounded combat personnel in a helicopter with a minimum of effort. A pair of upright and spaced frames are provided each with a pair of powered, upright, endless chains to lift litters bearing the wounded into stacked arrangement in an aircraft. Electric motors drive the chains which

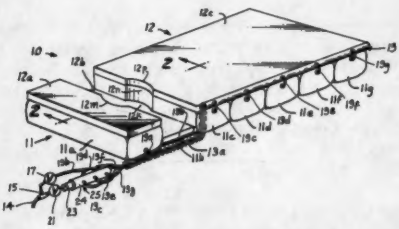


have clamps to engage the litters for lifting. A pair of rails fixed to the racks receive the legs of a litter in position for engagement with the clamps.

3,605,137
CARRYING POLES FOR STRETCHER-BEARING
Hans Stollenwerk, Dellbrucker Hauptstrasse 197/201, Cologne-Dellbruck, Germany
Filed June 3, 1969, Ser. No. 830,051
Claims priority, application Germany, June 4, 1968, P 17 66 508.6-35
Int. Cl. A61g 7/10
U.S. Cl. 5—82 5 Claims

A hollow stretcher carrying pole of reinforced synthetic plastics material having at least one longitudinal rib.

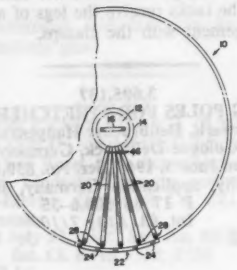
3,605,138
INFLATABLE BED PAD PROVIDING BED PAN SPACE
Samuel Morris Tucker, Waco, Tex., assignor to Wesley D. Ballard and John H. Staley, both of Waco, Tex., fractional part interest to each
Filed Jan. 5, 1970, Ser. No. 618
Int. Cl. A61g 7/02; A47c 27/08
U.S. Cl. 5—90 8 Claims



The disclosure is to a bed pad that ties together in abutment, under the pad cover, inflatable compartments occupying successive areas acros sthe pad from foot to head. A bed pan supporting compartment with cover thereupon separates compartment means with lower cover thereupon from a plurality of compartments with upper cover thereupon. A spool valve is provided selectively to

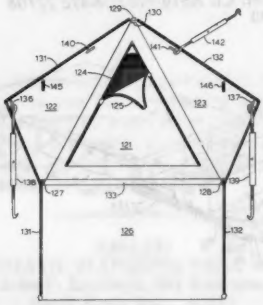
be advanced to allow compressed air to pass successively through individual channels to inflate in succession the compartment means and then the compartments, preferably two at a time. The compressed air supply is split so that compressed air may be selectively directed to inflate the bed pan supporting compartment to the level of the other inflated compartments at times when it is not desired to have this compartment deflated to provide space for service insertion, as by a bed pan.

3,605,139
COLLAPSIBLE PLAYPEN
Herbert T. Lorentz, Jr., 234 Glenwood SW., North Canton, Ohio 44720
Filed Mar. 3, 1969, Ser. No. 803,929
Int. Cl. E03d *13/00*
U.S. Cl. 5—99R **2 Claims**



The container includes center support, an annular lazy tong enclosure unit positioned on a vertical axis and expandable and collapsible circumferentially, a plurality of support slats attached to the center support, and hinge means pivotally securing the outer ends of the slats to a lower portion of the annular enclosure unit.

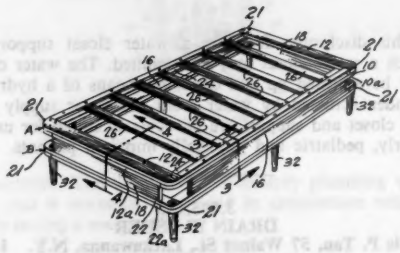
3,605,140
PORTABLE BUNK TENT AND BUNK TENT COMBINATION
Vance R. Wanner, 8416 Tenly St., Alexandria, Va. 22308
Filed Mar. 10, 1969, Ser. No. 805,464
Int. Cl. A47c *29/00*
U.S. Cl. 5—113 **14 Claims**



A novel portable bunk comprising two connected box-like portions, means for folding one of the portions onto the other to form a closed case for easy transportation, means for maintaining the bunk structure in the open position, and means for four individually removable and slidably adjustable legs to enable the bunk structure to be set up on irregular or sloping terrain or suspended between vertical supports. Also included is a novel foldable tent canopy preferably designed for the above portable bunk, having standing ends for support and lacking the usual ridgepole.

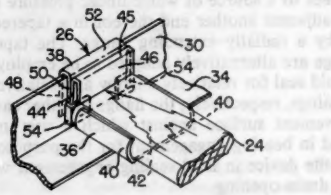
The tent-bunk combination comprises a foldable bunk frame provided with slidably adjustable legs for said bunk frame and a tent canopy removably attached to said bunk frame.

3,605,141
BOX CONSTRUCTION
Nordau Silverman, 89 Glenbrooke, Dollard-des-Ormeaux, Quebec, Canada
Filed Feb. 7, 1969, Ser. No. 797,546
Int. Cl. A47c *19/00*
U.S. Cl. 5—200 **7 Claims**



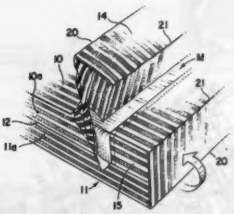
The invention provides a box frame or base for bedding equipment in which there is upper and lower spaced apart individual frame sections connected by supporting members on at least two sides of the frame sections. Such units are provided with the upper frame having a portion for providing a supporting surface on which mattress supporting means may be mounted. The units may be provided with suitable legs connected to the frame.

3,605,142
SAFETY BED SLAT BRACKETS
Maurice Weinhart, 18620 Ardmore St., Detroit, Mich. 48235
Filed Sept. 16, 1969, Ser. No. 858,407
Int. Cl. A47c *23/06*
U.S. Cl. 5—238 **14 Claims**



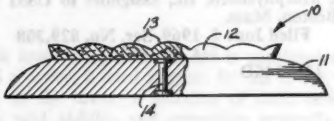
The invention relates to safety bed slat brackets for engagement upon supporting metal side rails of a bed frame, the brackets having adjustable features permitting engagement upon the vertical legs of side rails having different heights. The brackets are particularly adapted for use with wooden bed slats of conventional current cross-sectional configuration, but may be easily adapted to varying shapes of such bed slats. The brackets are also arranged to provide for positive engagement with the wooden bed slats so as to limit and substantially retard lateral movement between the side rails of the bed frame.

3,605,143
POCKET COVER FOR RECTANGULAR OBJECTS
Imre Jack Smith, 283 Hillhurst Blvd., Toronto, Ontario, Canada
Filed Apr. 23, 1969, Ser. No. 818,668
Int. Cl. A47g 9/00, 7/06, 13/09
U.S. Cl. 5—335 3 Claims



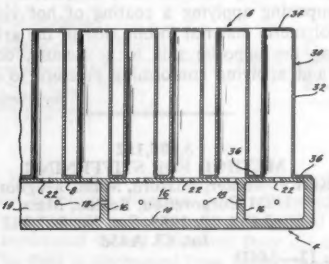
A cover for a rectangular object of compressible material such as a mattress, pillow or the like in which all fastening means such as buttons, zippers, etc. are dispensed, the cover being provided with two interfitting pockets at the open end of the cover which are designed to fit around one end of the core, and fit one on top of the other thereby closing the cover without the use of any extra fastening means.

3,605,144
HEAD PAD
Clinton E. Hayte, P.O. Box 114, Neah Bay, Wash. 98357
Filed Oct. 21, 1968, Ser. No. 769,236
Int. Cl. A47c 7/48
U.S. Cl. 5—338 3 Claims



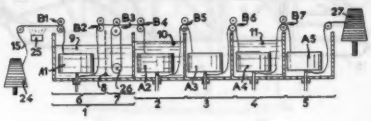
A circular disk with a cushion pivotable from the center for use by athletes in performing neck exercises with their heads on the floors. This device is also useful to weight lifters and wrestlers.

3,605,145
BODY SUPPORT
Robert H. Graebe, 4 Signal Hill Blvd., East St. Louis, Ill. 62203
Filed Dec. 5, 1968, Ser. No. 781,472
Int. Cl. A47c 27/08
U.S. Cl. 5—348 11 Claims



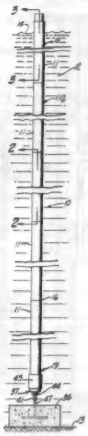
A body support including a plurality of pliant outwardly extending air cells which are in communication with one another through a base. When loaded the air cells support the load with substantially the same force per unit area irrespective of the amount they are deflected.

3,605,146
PROCESS AND APPARATUS FOR AUTOMATICALLY AND CONTINUOUSLY DYEING A TEXTILE THREAD
Jean Amengual, Chemin du Couter, Saint-Cyr-au-Mont-d'Or, France
Filed Mar. 20, 1969, Ser. No. 808,911
Claims priority, application France, Mar. 20, 1968, 49,787, Feb. 27, 1969, Patent 5,509
Int. Cl. B05c 3/138
U.S. Cl. 8—151.1 8 Claims



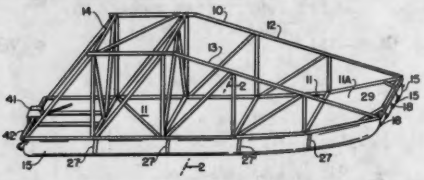
The invention provides processes and apparatus for the continuous liquid treatment of a textile thread, which enables the thread to be dyed before winding on to a package and thus avoids the more expensive package or fabric dyeing operations.

3,605,147
MARKING SYSTEM
Vernon E. Shelton, 923 8th St., Manhattan Beach, Calif. 90266
Filed Mar. 3, 1970, Ser. No. 16,060
Int. Cl. G08b 17/00
U.S. Cl. 9—8 23 Claims



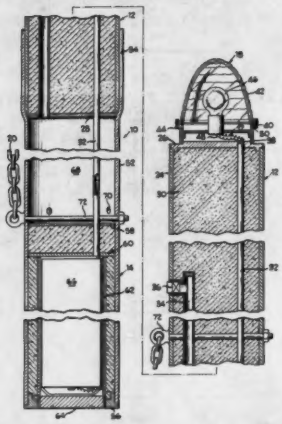
A location is marked or an object is marked and maintained beneath, on or above the surface of a body of water, such as the ocean, by a semi-rigid, semi-flexible, self-suspending device which includes at least one or, preferably a plurality of individual pressure adjusting segments. The lower end of the device is secured to the bottom and thereby remains in a fixed position in the water, while the upper end is unsecured and extends a visible distance above the surface of the water, essentially in a position above the fixed end.

3,605,148
WATERCRAFT
Peter L. Tailer, 323 E. 17th St., New York, N.Y. 10003
Continuation-in-part of application Ser. No. 765,499, Oct. 7, 1968. This application Mar. 3, 1970, Ser. No. 16,069
Int. Cl. B63b *35/00*
U.S. Cl. 9—1R 10 Claims



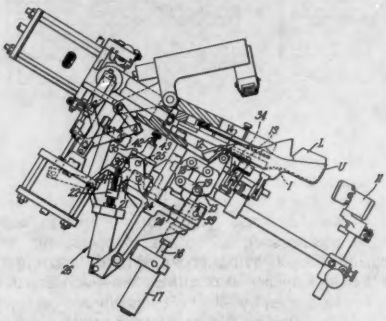
A float boat has a flat bottom sloping upward at its forward end, and inflatable floats fixed below the flat bottom, the flat bottom being structurally braced and rigid, the floats being adjacent tubes extending longitudinally substantially completely below the area of the bottom, the floats having front ends held upward below the upward sloping forward end of the bottom.

3,605,149
SIGNAL BUOY
John B. Keats, Scottsburg, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Aug. 22, 1969, Ser. No. 852,389
Int. Cl. B63b *21/52, 51/02*
U.S. Cl. 9—8.3 9 Claims



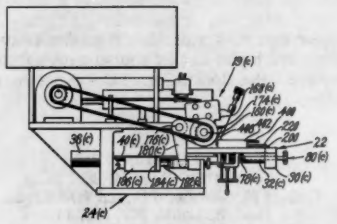
A floatable signal buoy for marine use including an elongated body having a visible section defining a signal portion and a submergible section defining a weighted end providing a restoring force to maintain the body in an essentially vertical operating position. The body defines a ballast chamber adjacent the weighted end and a conduit is provided to introduce air into the ballast chamber to increase buoyancy to cause the buoy to assume an oblique attitude with respect to the surface of the water.

3,605,150
SHOE LASTING MACHINES
Raymond M. Bowler, Salem, N.H., and Leo F. Stanton, Newburyport, Mass., assignors to USM Corporation, Boston, Mass.
Filed June 8, 1970, Ser. No. 44,226
Int. Cl. A43d *75/00*
U.S. Cl. 12—10.8 3 Claims



An improved shoe forepart lasting machine in which registration of an insole and an upper with a last is provided by a mechanism for moving the last heelwardly into the lasted heel end of the shoe.

3,605,151
METHOD FOR APPLYING COATING MATERIAL
John R. Maifeld, Jr., Lynnfield, Mass., and Kenneth L. Rains, Murphysboro, Ill., assignors to USM Corporation, Boston, Mass.
Filed June 2, 1969, Ser. No. 829,308
Int. Cl. A43d
U.S. Cl. 12—146D 2 Claims

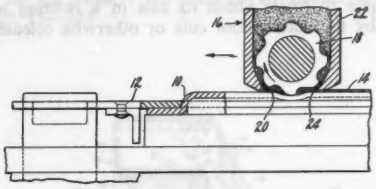


A method for providing a pervious article of commerce with a permanently stiffened three dimensional configuration comprising applying a coating of hot viscous synthetic polymeric material to one side of the article while subjecting the opposite side to a vacuum, cooling the article, and applying conforming pressure to shape the article.

3,605,152
METHOD FOR STIFFENING
Karl V. Becker, Boxford, Mass., assignor to USM Corporation, Boston, Mass.
Filed Oct. 20, 1969, Ser. No. 867,642
Int. Cl. A43d
U.S. Cl. 12—146D 11 Claims

A method for stiffening a selected area of sheet material, particularly areas of shoe components in which a first coating of molten resin is laid down on the area to

be stiffened, a flexible fibrous reinforcement is laid down on the coating while exposed portions of the coating are in soft adhesive condition and thereafter a second coating

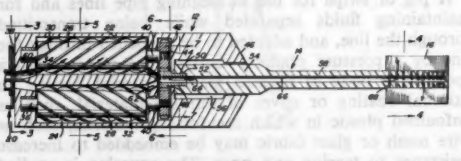


of viscous molten resin is applied to cover the reinforcement and extend over the edges of the reinforcement to merge into the first coating.

3,605,153
SINGLE TOWER SUSPENSION BRIDGES
Dominick George Constantino, 196—43 49th Ave., Flushing, N.Y. 11365
Continuation of application Ser. No. 798,926, Feb. 13, 1969, which is a continuation-in-part of application Ser. No. 616,760, Feb. 14, 1967. This application Mar. 10, 1970, Ser. No. 17,042
Int. Cl. E01d *11/00*
U.S. Cl. 14—18 **5 Claims**

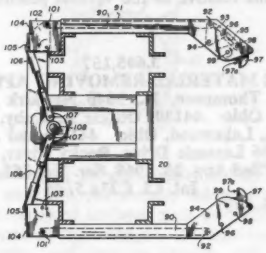
A single tower suspension bridge is constructed which comprises a tower, a fixed support for the tower, saddles supported on the tower, a plurality of main cables supported by said saddles and extending generally downwardly therefrom, two spans which together run the length of the bridge, a plurality of suspender cables extending from the main cables and supporting said spans and anchorage means for securing the cable ends.

3,605,154
MECHANICAL BRUSHING UNIT
Thomas C. Dawkins, 132 W. Main, Anadarko, Okla. 73005
Filed Mar. 12, 1970, Ser. No. 18,906
Int. Cl. A46b *13/06*
U.S. Cl. 15—24 **6 Claims**



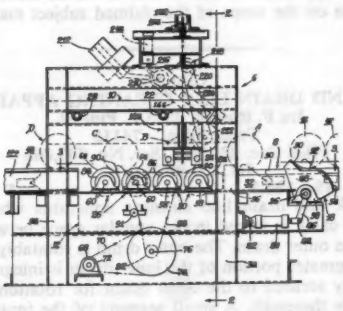
A rotary brush element is driven through gearing by one of a pair of turbine elements in an elongated body having inlet and outlet ports through which fluid under pressure is introduced to and exhausted from the turbine elements. The fluid is discharged from the brush element through orifice apertures between the brush bristles. A control valve blocks flow through a selected inlet port to determine the direction of rotation of the brush element.

3,605,155
LATCHING MECHANISM FOR APPARATUS UTILIZED IN CLEANING COKE OVEN DOORS
Charles D. McCullough, Metropolis, Ill., and Leo G. Schroeder, New Hyde Park, N.Y., assignors to Wilputte Corporation
Filed July 18, 1969, Ser. No. 842,856
Int. Cl. C10b *43/04*
U.S. Cl. 15—93 **7 Claims**



In apparatus for scraping undesired substances formed on the flange surface area of a coke oven door during a coking operation and which apparatus includes a door cleaner head having a scraping means thereon, a latching mechanism is provided for securely holding the cleaner head with the door to be cleaned in an oriented position. The latching mechanism includes a pair of latching links extending along opposing lateral surfaces of the door cleaner head, the far end of each latching link being provided with a pivotally mounted locking finger having a locking surface thereon for grasping the door flange and the near end of each latching link being provided with a pivotal means. Adjustable members interconnect each of the near end pivotal means to a crank-shaft which is operated by an actuating means for moving the fingers between locked and unlocked positions through the latching links, pivotal means and adjustable members.

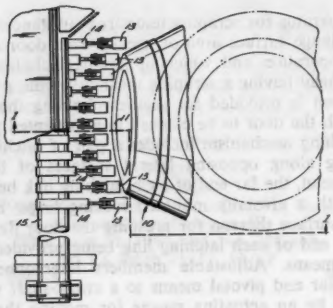
3,605,156
APPARATUS FOR CLEANING CYLINDRICAL MEMBERS
Howard E. George, Itasca, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Mar. 3, 1969, Ser. No. 803,592
Int. Cl. A46b *13/02*
U.S. Cl. 15—88 **10 Claims**



An apparatus is provided to remove chemical compounds from the bearing journals and wheel seats of railway axles. Axles are moved through the apparatus

position by position by an escapement mechanism, conveyor arrangement and a movable transfer car. An axle is moved to a first position where it is rotated by rollers. The ends of the axle are soaked with heated solvent and then rubbed by rotating brushings. From there the axle is moved to a second position where it is rotated and flushed with heated solvent. During the removal operation, axles may be located at each of the positions and moved simultaneously to the next position by the transfer car. Means are also provided to center each axle within the apparatus relative to the various positions.

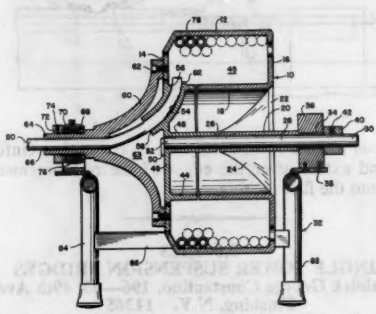
3,605,157
WASTE MATERIAL-REMOVING APPARATUS
Harvey E. Thompson, Jr., 9040 Newkirk Drive, Parma Heights, Ohio 44130; Otakar A. Kuby, 17533 Madison Ave., Lakewood, Ohio 44107; and Allan D. Taylor, 22486 Laramie Drive, Rocky River, Ohio 43458
Filed Aug. 25, 1969, Ser. No. 852,695
Int. Cl. C21c *5/46*
U.S. Cl. 15—93 **15 Claims**



Apparatus for scraping slag, metal or other waste material from the mouth of a basic oxygen furnace converter when the converter is rotated downwardly from an upright position. The apparatus has individually pivoted scrapers with individual shear pins, each permitting the respective scraper to move to an out-of-the-way position when overloaded without affecting the operation of the other scrapers. The scrapers can pivot to out-of-the-way positions when the converter is moved back up. The foregoing abstract is merely a résumé of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

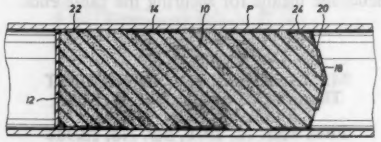
3,605,158
SINK AND DRAIN LINE CLEANING APPARATUS
Ira F. Russell, 3333 E. Pine St., Tulsa, Okla. 74115
Filed Dec. 30, 1968, Ser. No. 787,868
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.3 **5 Claims**

A sink and drain line cleaning apparatus wherein a cleaning cable is stored in the annular space between an inner and outer drum. The outer drum is rotatably driven and the greater portion of the inner drum is integral with or rigidly secured to the outer drum for rotation simultaneously therewith. A small segment of the inner drum is independent of the greater portion thereof and is free wheeling or independently rotatable with respect thereto. The cable is wound around the inner drum with one end thereof being secured to the driven portion of the drum and the opposite or free end thereof extending axially outward from the annular space for insertion within the line being cleaned thereby. A suitable cutting tool is secured to the free end of the cable and rotation of the outer drum and integral portion of the inner drum causes the cable to rotate about its axis in a twisting motion whereby the cutting tool cuts or otherwise releases any



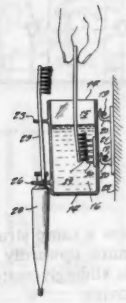
obstruction within the line. The annular chamber housing the wound cable is particularly designed and constructed for substantially precluding kinking of the cable upon the sudden release of tension therein when an obstacle in the line is cut loose. In addition, the inner drum structure greatly reduces friction on the cable during a cleaning operation, thus reducing wear on the cable and prolonging the useful life thereof.

3,605,159
PIPE LINE PIG OR SWIPE
Harry J. Girard, 3202 Huntingdon, Houston, Tex. 77019
Filed Nov. 20, 1968, Ser. No. 777,448
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 **1 Claim**



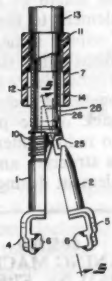
A pig or swipe for use in cleaning pipe lines and for maintaining fluids separated while being transmitted through the line, and adapted to be propelled through the line by a pressure gradient therein. The pig includes a sponge-like body of foamed plastic material, having an external coating or cover of durable material, such as unfoamed plastic in which reenforcing material, such as wire mesh or glass fabric may be embedded to increase resistance to tearing and wear. The covering is applied to leave openings through which the sponge-like body may project into wiping contact with the surrounding internal surface of the pipe when a longitudinal compressive force is exerted on the pig by the fluid in the pipe in advance of and following the pig therein. The pig also has a barrier layer at one end positioned to close the sponge-like body against the passage of fluid therethrough and to form a fluid tight seal with the surrounding pipe.

3,605,160
COMBINED TOOTHBRUSH RACK AND CLEANER
Rueben H. Maurer, 3733 Edgefield Ave. NW., Canton, Ohio 44709
Filed Mar. 25, 1969, Ser. No. 810,178
Int. Cl. A46b *11/00*; A47g *29/08*; B08b *1/00*
U.S. Cl. 15—105 3 Claims



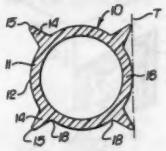
A device for cleaning a toothbrush, the device comprising a plastic vessel or glass having a plastic brush secured to an inner side wall thereof, against which a tooth brush may be stroked during cleaning operation, the plastic vessel including means for supporting a plurality of tooth brushes and tooth paste tubes, the vessel further including means for mounting the same to a vertical wall of a bathroom.

3,605,161
ATTACHMENT DEVICE FOR MOPS AND THE LIKE
Theron V. Moss, 3175 Falmouth, Shaker Heights, Ohio 44120, and Austin T. Dalhart, Bay Village and Erwin Tomm, Cleveland, Ohio; said Dalhart and Tomm assignors to said Moss
Continuation of application Ser. No. 744,851, July 15, 1968. This application Nov. 10, 1969, Ser. No. 875,517
Int. Cl. A47l *13/20*
U.S. Cl. 15—150 11 Claims



An attachment device for mops and the like including a pair of movably interconnected clamping members adapted to secure a mop between the ends thereof. A collar surrounds the clamping members and is adapted for longitudinal movement to secure the clamping members in a closed position about a swab and for movement out of engagement with the clamping members to permit removal of the swab.

3,605,162
BRUSH FILAMENT AND CONSTRUCTION THEREFOR
Mace E. Long, Long Beach, Calif., assignor to Industrial Brush Company, Pomona, Calif.
Filed Mar. 14, 1969, Ser. No. 807,314
Int. Cl. A46d *1/00*; D01d *5/00*; D01f *1/00*
U.S. Cl. 15—159 16 Claims



A brush filament of polymeric material of novel composition and structure particularly adapted for use on nonuniform interrupted surfaces such as vehicle surfaces. A brush filament of light weight, low breaking strength, structural rigidity sufficient to provide full cylindrical brush configuration at relatively low rational speeds, resistance to wear and fraying or splitting, and freedom from curl and maintenance of separate discrete filament relationship, the filament including a tubular portion with spaced longitudinal ribs, the rib edges defining planes tangent to the convex surfaces of the tubular portion lying between said rib edges.

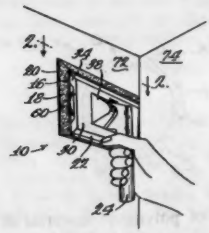
3,605,163
BACTERIOSTATIC TOOTHBRUSHES
Arthur W. Bechtold, Boonton, N.J., assignor to Chemway Corporation, Wayne, N.J.
No Drawing. Filed Jan. 10, 1969, Ser. No. 790,476
Int. Cl. A46d *1/00*; A01n *17/00*
U.S. Cl. 15—159 6 Claims

Toothbrushes having bacteriostatic nylon bristles are produced by immersing the bristles in an aqueous-alcoholic solution containing a bacteriostat selected from the group consisting of 2,2'-methylene bis[3,4,6-trichlorophenyl] and 2,4,4' - trichloro-2' - hydroxydiphenyl ether. Boric acid in small amounts may also be added to the solution to assist in the conditioning of the bristles.

3,605,164
CURLING BROOM
George F. Harris, 13 Mager Drive, Winnipeg, Manitoba, Canada
Filed Mar. 7, 1969, Ser. No. 805,295
Int. Cl. A47l *25/00*
U.S. Cl. 15—210R 1 Claim

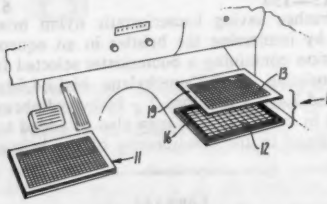
A curling broom compacted from polyurethane foam in a mould and covered with a latex skin. A flexible plastic strip is embedded in the foam to act as a spring.

3,605,165
PAINT APPLICATION WITH GUIDE MEANS
Frederick B. Burns, South Milwaukee, Wis., assignor to EZ Paintr Corporation
Filed Dec. 11, 1968, Ser. No. 782,974
Int. Cl. A46b *15/00*
U.S. Cl. 15—210 7 Claims



A paint applicator with guide means for painting a surface which abuts an intersecting surface, characterized in that the guide means, preferably in the form of rollers, project outwardly beyond opposite sides of the applicator and lie on either side of the handle. Preferably, the applicating surface is trapezoidal with the rollers overhanging nonparallel edges which converge toward each other.

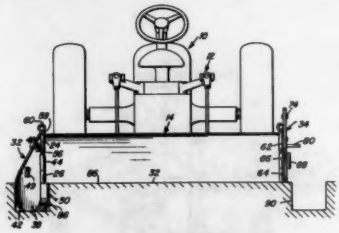
3,605,166
FLOOR MAT CONSTRUCTION
John W. Chen, 1168 Broadway, San Francisco, Calif. 94109
Filed Feb. 20, 1969, Ser. No. 801,117
Int. Cl. B62d *25/20*
U.S. Cl. 15—215 7 Claims



A floor mat construction especially suitable for use in the interior of automobiles comprising a tray, a grate and fastening means for removably securing the grate in a desired position over the tray; the tray being formed with internal partitions defining a plurality of open-top compartments formed to hold mud, water and the like in a fixed area against splashing; a grating formed to fit over the tray and completely cover the partitions therein, with the grate being formed with tapered sides and terminating in knife-like upper edges; the whole mat construction preferably being formed of tough, light-weight resilient material such as rubber or rubber compositions, and with the grating providing a larger number of small openings than is provided by the compartments but preferably of the same shape.

3,605,167
WING GUTTER CLEANER
Andre J. Martel and Jerome E. Martel, both of R.F.D. 2, Williston, Vt. 05495
Filed Mar. 12, 1969, Ser. No. 806,408
Int. Cl. A01k *1/00*
U.S. Cl. 15—236 8 Claims

An attachment for a rearwardly facing tractor lift arm mounted tractor blade. The attachment includes a pair of blade arms secured to and projecting rearwardly from the opposite ends of the blade for limited vertical floating relative thereto and one of the blades is disposed lower than the other and is slightly outwardly inclined toward



its rear end and includes a ramp structure at its forward end for scooping manure upwardly out of a gutter in which the one blade is slidingly seated and along which the tractor blade is moving.

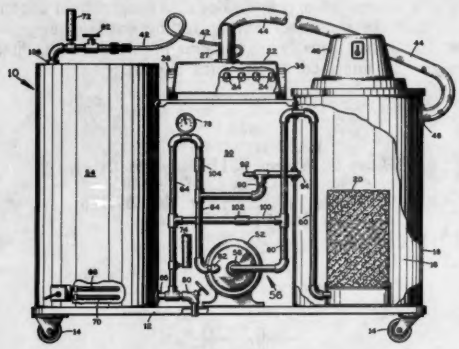
3,605,168
WINDSHIELD WIPER BLADE
John P. Moorhead, Valparaiso, and Leo J. Wubbe, Beverly Shores, Ind., assignors to The Anderson Company, Gary, Ind.
Filed Mar. 16, 1970, Ser. No. 19,923
Int. Cl. B60s *1/40*; A47l *1/02*
U.S. Cl. 15—250.42 23 Claims

This invention relates to windshield wiper blade assemblies for wiping a curved or a flat windshield. The assembly includes a wiping element and a pressure distributing structure operatively connected together in such a way as to transmit pressure received by the pressure distributing structure from a wiper arm and to distribute said pressure along the length of the wiping element to conform the wiping element to the shape of the surface of the windshield for wiping same. A member or members of the pressure distributing structure is located laterally of the wiping element so as to reduce the height of the profile or silhouette of the structure, to minimize the effect of snow pack or ice pack on the wiper in wintry weather, and to reduce interference between each of the members of the structure and between such members and the wiping element during flexing of the wiper.

3,605,169
CLEANING MACHINE
Charles R. Howerin, 1631 NE. 57th St., Fort Lauderdale, Fla. 33308, and Marion W. Humphreys, Fort Lauderdale, Fla.; said Humphreys assignor to said Howerin
Filed Feb. 24, 1969, Ser. No. 801,432
Int. Cl. A47l *13/26*
U.S. Cl. 15—321 3 Claims

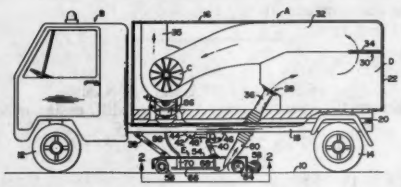
A cleaning machine which is particularly useful for cleaning carpets. A preferred embodiment of the machine includes a head for directing a cleaning liquid such as water or an aqueous cleaning solution onto a carpet or the like and for withdrawing soil and excess liquid from the carpet and supplying it to a chamber which contains a

filter. A blower may be utilized to suck the excess liquid and soil into the chamber or tank for containing liquid. The liquid is forced through the filter, for example by means of a pump, and the filter acts to remove contamnants from the liquid. The clean liquid flows from the exhaust side of the filter through a flow circuit back to



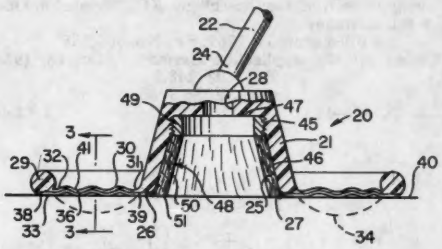
the head where it is directed against the carpet, for example as a spray. A heater is provided to raise the temperature of the liquid so that it is very hot when sprayed, thereby improving its cleaning action. Thus, the machine involves a combination of recirculation, filtering and heating providing good cleaning and high efficiency.

3,605,170
MOBILE SUCTION CLEANING DEVICE
Emil J. Hank, Minerva, and Henry D. Luther, Massillon, Ohio, assignors to Gulf + Western Industrial Products Company, Grand Rapids, Mich.
Filed Mar. 11, 1969, Ser. No. 806,202
Int. Cl. E01h *1/08*
U.S. Cl. 15—346 **10 Claims**



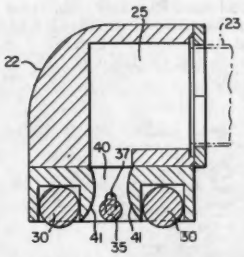
A suction cleaning device adapted to be moved in a forward direction over a surface to remove debris and other material therefrom, including a debris hopper, a suction duct leading to the hopper, fan means to draw air through the duct, and an improved pick-up chamber into which the duct extends removed from the hopper adjacent to the surface to be cleaned. The improved pick-up chamber is comprised of at least one suction nozzle inlet opening positioned within the pick-up chamber and in communication with the suction duct, and air jet means having a plurality of air outlet openings arranged in the chamber forward of and on opposite sides of the suction nozzle inlet openings, the air jet means possessing high impact characteristics to loosen the material from the surface and direct it toward the path of movement traversed by the suction nozzle inlet openings.

3,605,171
NOZZLE CONSTRUCTION FOR A VACUUM CLEANER OR THE LIKE
Robert R. Candor, Miami Township, Ohio (5940 Munger Road, Dayton, Ohio 45459), and James T. Candor, Washington Township, Ohio (5440 Cynthia Lane, Dayton, Ohio 45429)
Continuation-in-part of application Ser. No. 788,278, Dec. 31, 1968. This application Jan. 31, 1969, Ser. No. 795,453
Int. Cl. A47l *9/06*
U.S. Cl. 15—399 **7 Claims**



This disclosure relates to a nozzle construction for a vacuum cleaning apparatus or the like for applying a suction to a surface to be cleaned thereby, the nozzle construction comprising a support means having opening means therein provided with an outlet to be interconnected to a vacuum pump means and an inlet to be disposed adjacent to a surface means to be cleaned. A flexible wall surrounds the inlet so as to have one side thereof engaged against the surface means around said inlet to substantially seal the inlet of the support means to the surface means. The flexible wall is so constructed and arranged that a pressure differential acting across the same resulting from the vacuum pump means drawing fluid from the surface means into the inlet and out through the outlet of the opening means causes the flexible wall to be urged toward the surface means to substantially seal against the surface means around the inlet and substantially conform to the contour of the surface means outboard of the inlet.

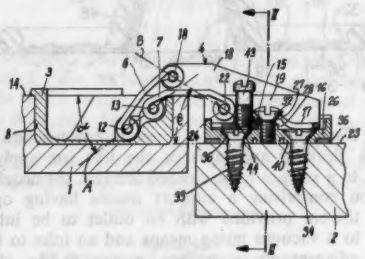
3,605,172
VACUUM CLEANER NOZZLE WITH VARIABLE VENTURI
Louis J. Damasco, 932 Marlyn Road, Philadelphia, Pa. 19151
Filed Apr. 6, 1970, Ser. No. 25,671
Int. Cl. A47l *9/02*
U.S. Cl. 15—419 **4 Claims**



A variable venturi nozzle for use with a vacuum cleaner or similar apparatus having a pair of fixed position parallel rollers with a channel therebetween communicating with a vacuum source, and a spring biased roller centrally placed between said fixed position rollers, and having its axis aligned in parallel with those of said fixed position rollers, said spring biased roller being movable within

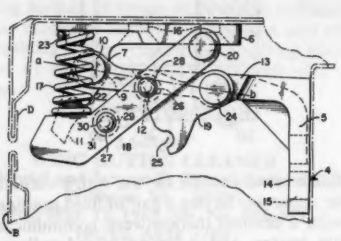
said channel and providing a varying channel opening according to its position. The channel sides are curved convex outward, such that a maximum cross-sectional outlet is provided when the moveable roller is in its lowest position, the outlet area decreasing as the roller is moved against the spring to higher positions.

3,605,173
HINGE WITH QUADRILATERAL SWING JOINT AND MOUNTING PLATE THEREFOR
Karl Lautenschläger, Jr., Wersau, Odenwald, Germany, assignor to Karl Lautenschläger KG., Reinheim, Odenwald, Germany
Filed Mar. 11, 1969, Ser. No. 806,156
Claims priority, application Germany, Mar. 18, 1968, P 17 08 248.3
Int. Cl. E05d *3/06*
U.S. Cl. 16—163 **3 Claims**



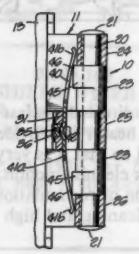
A hinge of the type having a pair of pivot members forming a quadrilateral swing joint. Opposite end portions of the pivot members are pivotally connected to a holder mounted upon a door and a carrier arm removably mounted in a mounting member fastened to a carrier wall. An innermost one of the pivot members is pivotally connected to the carrier arm at a point overlying a fastening member securing the mounting plate to the carrier wall. Adjustment means pass through the carrier arm immediately adjacent the pivot point of the innermost pivot member and engages against the mounting plate. The carrier arm is further characterized by a substantially U-shaped cross section forming a base portion intermediate a pair of spaced leg portions and has a longitudinally elongated slot formed in the base portion for receiving an attachment member cooperating with the slot to spread the legs into firm engagement with opposed, confronting wall portions of the mounting plate.

3,605,174
TOGGLE TYPE HOLD OPEN HINGE
Joseph H. Marchione, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.
Filed Aug. 12, 1969, Ser. No. 849,362
Int. Cl. E05d *11/10*
U.S. Cl. 16—145 **7 Claims**



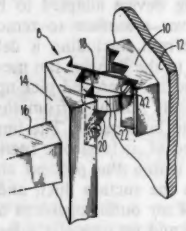
A spring loaded toggle link is pivoted at one end to one hinge member and cooperates intermediate its ends with a second toggle link pivoted to the other hinge member to swing the second toggle link from one extreme position, in which the door is held open, to the other extreme position in which the door is held closed, the second toggle link being disposed in a neutral position in a mid-open position of the door in which the spring exerts the same resistance to dor movement in either direction. The second toggle link is the equivalent of a segmental gear, being provided with two spaced notches, equally spaced on opposite sides of a longitudinal center line, and these notches having rolling meshing engagement with two equally spaced pins provided on the first toggle link intermediate the ends thereof.

3,605,175
LATCHING HINGE
Harry C. Wilson, 15126 Rayneta Drive, Sherman Oaks, Calif. 91403
Filed Mar. 17, 1969, Ser. No. 807,796
Int. Cl. E05f *1/12*
U.S. Cl. 16—184 **21 Claims**



A paintable latching hinge having an adjustable leaf spring supported by a curl portion of one hinge leaf and cooperating with the specially shaped curl portions of the other hinge leaf to bias the hinge toward and away from closed position, and having no biasing effect in other positions hereof. The curl portions of both hinge leaves cooperate in the closed position to present the appearance of a gambrel roof as viewed from one end. Additionally, the biasing spring is so arranged as not to contact any exposed curl surface at any time.

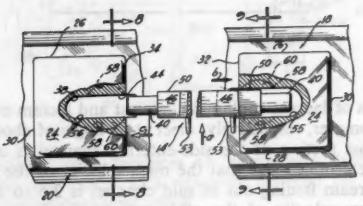
3,605,176
CROSS FLEXURE HINGE
Henry W. Jones, Castro Valley, Calif., assignor to The Singer Company
Filed Feb. 20, 1969, Ser. No. 801,071
Int. Cl. E05f *1/12*
U.S. Cl. 16—180 **7 Claims**



A hinge using cross flexure leaf springs is assembled by holding the hinged members snug against a cylindrical

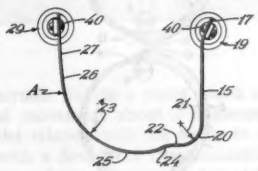
gauge and fastening the flexure elements. Preferably, the center of the gauge is aligned with the crossed centers of the flexure elements, and is retained in the assembly.

3,605,177
PULL
Robert S. Cartwright, Booneville, N.C., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed May 20, 1970, Ser. No. 39,113
Int. Cl. A07b *95/02*
U.S. Cl. 16—125 **11 Claims**



The following specification describes a pull in which a bail is pivotally supported by two spaced posts integrally formed on a common backplate with each post having concealed tangs formed therein to prevent disassembly of the bail.

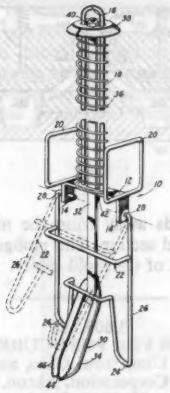
3,605,178
LOIN PULLING KNIFE
Edwin E. Hoffmann, 44 Otis Ave., St. Paul, Minn. 55104
Filed Jan. 16, 1970, Ser. No. 3,339
Int. Cl. A22c *17/00*
U.S. Cl. 17—1G **4 Claims**



A blade is bent into generally U-shaped form to separate the loin from the belly and fatback of a hog. The blade is sharply bent along a short radius at its point of entry through the scribe line so as to cut through the serratus dorsalis muscle.

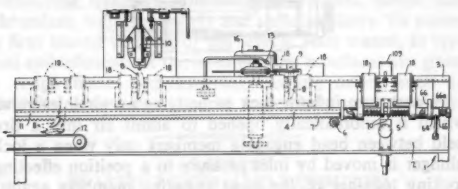
3,605,179
SHACKLE EVISCERATING MECHANISM
Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.
Filed Dec. 8, 1969, Ser. No. 883,201
Int. Cl. A22c *21/06*
U.S. Cl. 17—11 **10 Claims**

A mechanism combining a shackle for supporting a chicken or other fowl in a head lowermost position and a spoon-shaped member movably disposed thereon in a reciprocable path for being inserted into the abdomen of a chicken or other fowl suspended from the shackle and for withdrawing the viscera from the chicken or other fowl. The bird is suspended by its hocks from a hock-gripping member pivotally mounted on the shackle. The spoon-shaped member is biased toward a retracted or withdrawn position and is provided with a rearwardly



pointing serrated forward edge for permitting easy insertion into the bird, yet gripping or pulling the viscera upon spoon withdrawal.

3,605,180
APPARATUS AND METHOD FOR SHUCKING OYSTERS
Sterling G. Harris, Beaufort, and Ben P. Zober, Charleston, S.C., assignors to Harris Automated Machinery Co., Dover, Del.
Filed Sept. 30, 1968, Ser. No. 763,816
Int. Cl. A22c *29/00*
U.S. Cl. 17—74 **19 Claims**

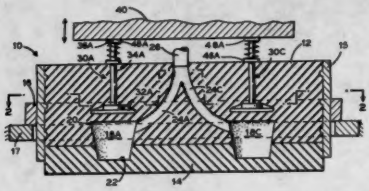


This invention pertains to shucking fresh bivalves and it encompasses both an apparatus and method which removes rapidly, and without damage, the edible portion of the bivalve. The invention consists of removing a portion of the shells of the bivalve (preferably after some of the fluids contained in the bivable cavity have been eliminated particularly in the case of oysters), thereafter severing muscles of the bivalve which connect the meat to the shells, and finally separating the meat and the shells, and the apparatus for accomplishing the foregoing operation. The invention pertains to bivables in general but is especially useful in the shucking of oysters and clams.

3,605,181
SPLIT-FACE MOLD WITH PLUNGER
Richard Posner, East Northport, N.Y., assignor to Creative Polymer Products Corp., Long Island City, N.Y.
Filed Mar. 12, 1970, Ser. No. 18,880
Int. Cl. B29c *7/00*
U.S. Cl. 18—2RC **7 Claims**

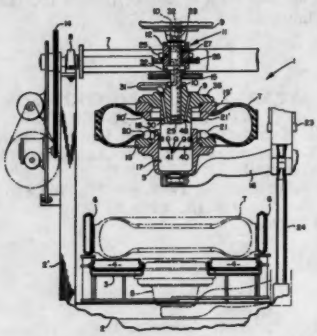
A split-face mold includes at least one section of elastomeric material. Within this section is at least a portion

of the mold cavity. Also, within this section is a rigid plunger with a face plate opposite the mold cavity and



a shaft that extends away from the mold cavity to the outside of the mold section. The plunger is used to force molded articles out of the mold cavity.

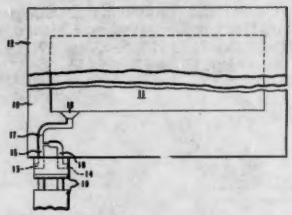
3,605,182
LOCK MEANS FOR POST-CURE INFLATOR
Ernest S. Ulm, Stow, Ohio, assignor to NRM Corporation, Akron, Ohio
Filed Aug. 25, 1969, Ser. No. 852,849
Int. Cl. B29h *5/02*
U.S. Cl. 18—2TP **9 Claims**



A post cure inflator lock embodying an air inlet valve which is automatically opened to admit air into a tire held between bead engaging members only when a lock plunger is moved by inlet pressure to a position effecting locking together of the bead engaging members against separation. The lock herein is also arranged so that when the inlet passage is vented, the tire deflates through the inlet valve to nearly ambient pressure before the lock plunger is permitted to move to unlocking position whereat the inlet valve is closed and another vent passage is opened.

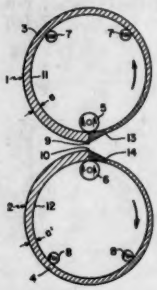
3,605,183
MIXING AND CASTING LACTAM COMPOSITIONS
Robert S. Heckrotte, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Original application Dec. 8, 1966, Ser. No. 600,222, now Patent No. 3,494,999, dated Feb. 10, 1969. Divided and this application Feb. 12, 1969, Ser. No. 871,483
Int. Cl. B29b *1/06, 5/04;* **B01f** *5/04*
U.S. Cl. 18—5R **2 Claims**

In casting molten monomeric lactams to form solid polylactam objects, separate streams of a catalyst-containing lactam composition and promoter-containing lactam composition, respectively, are forced through channels, one lactam stream being laterally introduced into the other at an angle of about 90° and with a mass-velocity about 2.5 to 3 times the mass-velocity of the other lactam stream. The resulting uniform mixture is passed to a mold cavity for polymerization and shaping, and upon completion the mold is opened and the solid article removed. In a multipart casting mold, one part is a mold block and the other a cover plate. Two separate channels in the mold block, which convey separate



streams of lactam containing catalyst and lactam containing promoter, respectively, meet at an angle of about 90°, the cross section of the side-entering channel is of such a predetermined size that the mass-velocity of the monomer stream issuing out of said channel is 2.5 to 3 times the mass-velocity of the other monomer stream, and a common channel conveys the mixture to the mold cavity.

3,605,184
ROLLING MILL FOR PRODUCING LONGITUDINALLY TAPERED SHEET, PLATE AND SECTIONS
Charles P. Mueller, Upper St. Clair Township, Allegheny County, Pa., and William A. McNeish, New Hartford, N.Y., assignors to Cyclops Corporation, Universal-Cyclops Specialty Steel Division, Pittsburgh, Pa.
Filed Mar. 14, 1969, Ser. No. 807,309
Int. Cl. B29d *7/10*
U.S. Cl. 18—9 **5 Claims**

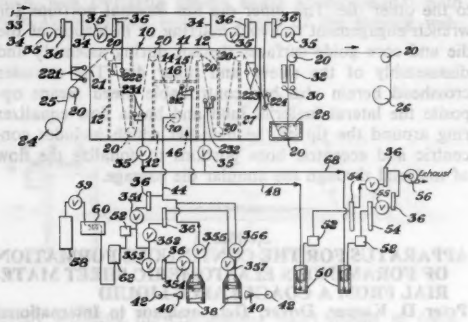


A rolling mill for rolling longitudinally tapered sheet, plate and sections whereby the work rolls are eccentric hollow sleeves. These eccentric hollow sleeves have a cylindrical inner surface and a tapered roll wall thickness around the periphery of the roll for rolling tapered sheets and plates and a tapered recess in a constant thickness roll wall for rolling tapered sections. The rolls are driven and supported by smaller rolls positioned within the hollow work rolls.

3,605,185
APPARATUS FOR PRODUCING A LATENT DECORATED EFFECT ON PLASTIC FILMS
Lawrence J. Kyle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 4, 1969, Ser. No. 882,134
Int. Cl. B29d *7/20, 7/22, 7/26*
U.S. Cl. 18—10 **10 Claims**

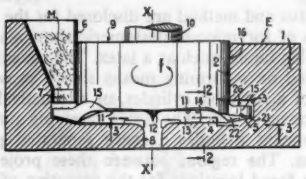
An apparatus for the rapid vapor phase sulfonation of plastic films wherein the film is treated with a jet of a

gas containing sulfur trioxide to achieve a latent decorated effect. Subsequent dyeing of the treated film with



water soluble dyes produces an attractively decorated, distinctive film useful as a wrapping material for edible and non-edible consumer goods.

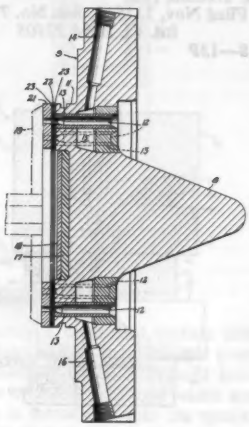
3,605,186
PLATE EXTRUDER WITH IMPROVED FEED MEMBERS
Claude Wagner, Pont-a-Mousson, France, assignor to Societe Sidel, Le Havre, France
Filed Mar. 13, 1970, Ser. No. 19,288
Claims priority, application France, Mar. 21, 1969, 8,264
Int. Cl. B29f *3/01*
U.S. Cl. 18—12C **8 Claims**



A plate extruder having a stator and a rotor mounted for rotational movement about a common axis and in spaced parallel relation with the stator to provide a gap in between with a feed inlet communicating with a peripheral portion of the stator and rotor and an extrusion die opening through an axial portion of the rotor, one or more teeth extending radially outwardly from the periphery of the rotor for positive displacement of plastic or rubber-like material from the feed opening into and through the gap between the plates to the extrusion die opening.

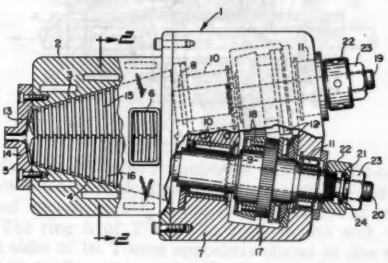
3,605,187
EXTRUDER STRUCTURES
Alfred Wurster, Warrington, and Robert C. Tanner, Southampton, Pa., assignors to Andale Company, Lansdale, Pa.
Filed Feb. 13, 1969, Ser. No. 798,894
Int. Cl. B29f *3/04*; B23k *31/02*
U.S. Cl. 18—12A **20 Claims**

A metallic sandwich, or multiple plate assembly, is provided, for applications where structural strength is required and at the same time an exposed surface must be highly resistive to abrasive wear, a typical application being an extruder head for the extrusion of plastics. For such an extruder structure, having discharge openings at the exit face, which face is adapted to cooperate with a moving cut-off blade, and for other suitable applications, the invention provides an assembly comprising a series of at least three plate means, one of which is a pressure plate and another of which is a wear plate, between which one or more accommodation plates are located, the plates being secured together in series relationship and being respectively made of materials having successively progressing different coefficients of thermal expansion, at least under certain critical temperature conditions; and the plates are typically secured together by brazing material at the interfaces, the said progressing different coefficients of thermal expansion being characteristic of



said plates at least at a temperature in the neighborhood of the freezing temperature range of the brazing material. The disclosure is inclusive, inter alia, of pressure plate means of stainless steel, wear plate means of tungsten carbide, and accommodation plate means variously embodying titanium, tantalum, iron, nickel, cobalt and chromium, some separately and some as alloys. To assure a firm brazed bonding of the several plate means, in typical embodiments of the invention the interfaces are given a rough finish. Supplemental securing means such as threaded devices may also be embedded in the assembly.

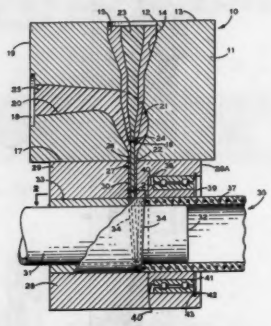
3,605,188
PLASTIC MIXER AND EXTRUDER
William S. McCormick, Cuyahoga Falls, Ohio, and William R. Topper, Newark, Del., assignors to NRM Corporation, Akron, Ohio
Filed Aug. 8, 1969, Ser. No. 848,633
Int. Cl. B29f *3/00, 3/06*
U.S. Cl. 18—12SP **6 Claims**



A twin conical screw plastic mixer and extruder having intermeshing conical screws rotatable within tapered, intersecting cylinder bores, and mechanism for axially

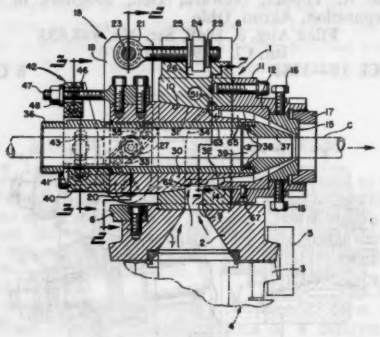
adjusting the screws with respect to the tapered cylinder bores thus to vary the degree of mixing of the material according to the leakage flow of material over the screw flights. When the screw axes converge toward the die inlet, the adjusting mechanism also changes the degree of intermeshing of the screw flights to further influence the mixing action.

3,605,189
APPARATUS FOR FORMING PLASTIC TUBING
Joseph F. Bauman and Thomas A. Caserta, Trenton, N.J., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.
Filed Nov. 1, 1968, Ser. No. 772,502
Int. Cl. B29d *23/05*
U.S. Cl. 18—13P **11 Claims**



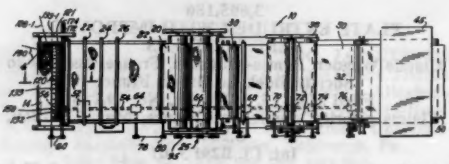
Apparatus for forming plastic tubing from continuously extruded plastic strip which may be of a homogeneous or composite nature, wherein the strip is passed to die means to convert the same into tubular form and including improved guide means for directing the moving strip into a helical path and to bring the successive convolutions of the strip into laterally abutting relation.

3,605,190
EXTRUDER CROSSHEAD
Raymond L. Christy, Akron, Ohio, assignor to NRM Corporation, Akron, Ohio
Filed June 24, 1969, Ser. No. 835,982
Int. Cl. B29f *3/00*
U.S. Cl. 18—13H **9 Claims**



An extruder cross head for extruding plastic material onto a core which travels longitudinally through an annular die passage defined by inner and outer dies characterized in the provision of a lever actuated mandrel which is wedged into and released from a tapered bore in the crosshead body, and a lever-actuated core guide and inner die sleeve which is longitudinally slidable in the mandrel for adjustment of the inner die with respect to the outer die. The inner die has internal portions for wrench engagement to avoid marring or distortion of the die and core guide surfaces thereof during assembly and disassembly of the sleeve and inner die. The extruder crosshead herein also has controllable bleed means opposite the lateral material inlet and has a flow equalizer ring around the tip of the mandrel which includes concentric and eccentric bore portions to equalize the flow of material through the annular die passage.

3,605,191
APPARATUS FOR THE CONTINUOUS FORMATION OF FORAMINOUS ELASTOMERIC SHEET MATERIAL FROM A COAGULABLE LIQUID
Peter D. Kaspar, Dover, Del., assignor to International Playtex Corporation, Dover, Del.
Continuation-in-part of application Ser. No. 704,783, Feb. 12, 1968. This application Feb. 4, 1969, Ser. No. 796,536
Int. Cl. B29c *13/04*; B29d *7/00, 27/00*
U.S. Cl. 18—15F **46 Claims**

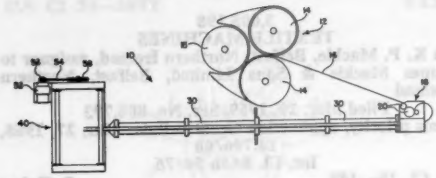


Apparatus and method are disclosed for the continuous formation of foraminous elastomeric sheet material from a coagulable liquid, such as a latex. The coagulable liquid is deposited on a forming means shown provided about the face of a rotatable cylinder, or alternatively along an endless conveyor belt. The liquid receiving surface of the forming means includes a space separated plurality of projections. The regions between these projections provide open faced locations for the reception of the coagulable liquid. A means for depositing the liquid as a layer on the forming surface is provided. This depositing means includes a spreading means at its exit which establishes the top surface of the liquid. An active gelling or coagulating agent is applied to the liquid layer immediately emerging from under the spreading means to prevent the formation of a gelled or coagulated film over the projection top surfaces, and form a hole in the deposited layer at each projection location. In the disclosed embodiments the spreading means is provided by a flexible blade member which wipes along the tops of the projections. The surface coagulant also serves to prevent the build-up of a coagulum along the blade spreading region. The liquid is coagulated and stripped from the forming surface as sheet material. In order to reduce the coagulation time, a heat-sensitive coagulable liquid may be used, with appropriate heat being applied to the forming surface.

3,605,192
CONTINUOUS MOTION CONTAINER MOLDING MACHINE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed July 28, 1969, Ser. No. 845,270
Int. Cl. B29c *17/03, 3/04, 7/00*
U.S. Cl. 18—19R **27 Claims**

A continuous motion container molding machine is provided with cooperating molds which operate upon

heated thermoplastic sheet or web material to form disposable containers. The heated sheet material web is continuously delivered to the cooperating molds, the transfer therebetween being accomplished by circumferential web clamping means along a coincidental path when synchronized with the speed of the moving web,



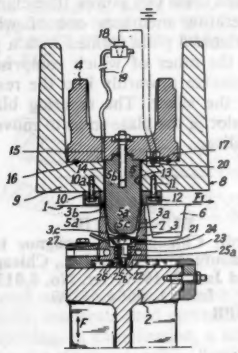
thereby enabling the cooperating mold means to form thin-wall, substantially uniform-in-thickness, containers from the material clamped off from the remainder of the moving web. Unique substations of the continuous motion container molding machine including sheet delivery, web clamping, scrap removal, and cup ejection substations are also disclosed.

3,605,193

APPARATUS FOR FORMING HOLLOW ARTICLES MADE OF THERMOPLASTICS MATERIAL

Etienne Marie Rogiers, Daknam, Belgium, assignor to Intercan S.A., Fribourg, Switzerland

Filed Jan. 14, 1970, Ser. No. 2,794
Claims priority, application Belgium, Jan. 14, 1969, 68,721
Int. Cl. B29c *17/03, 17/00, 11/00*
U.S. Cl. 18—19F **9 Claims**



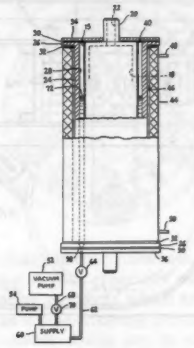
This disclosure relates to an apparatus for forming hollow articles made of thermoplastics material, wherein the locking plate 8 comprises a bore 13 coaxial to the mould 3, open at its two ends, the transverse section of which is equal to or slightly larger than that of the upper end of the hollow portion of the mould, the movable support 4 of the piston 5 is mounted so as to be able to move independently of the locking plate and rests, at the end of the piston stroke, on said locking plate, and a sealing joint is interposed between the locking plate and the movable support and surround the upper end of the bore. The disclosure is also applicable to installations for the large-scale manufacture of containers made from thermoplastics material.

3,605,194

RESILIENTLY FACED ROLLS

Jan P. Nauta, West Hartford, Conn., assignor to Rowland Products Incorporated, Kensington, Conn.

Original application Feb. 1, 1968, Ser. No. 702,470, now Patent No. 3,539,671. Divided and this application June 9, 1970, Ser. No. 44,762
Int. Cl. B29c *15/00*
U.S. Cl. 18—29 **6 Claims**



Rolls for producing a controlled surface finish upon synthetic thermoplastic sheet material are prepared by use of a support member which is inserted into a mold having an aperture or cavity of larger width and a synthetic plastic resin is introduced into the spacing therebetween in the form of a viscous fluid to form a coating on the support member. The coating of resin is oriented by relative rotation of mold and support member. The synthetic plastic is then cured and the resultant roll is used as at least one of a pair of rolls operating upon the surface of the heated thermoplastic sheet material so as to impress its surface characteristics thereupon.

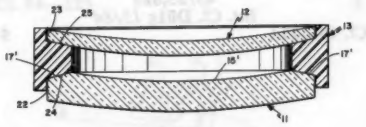
Although the surface of the roll may be mirror-polished, the rolls most advantageously have solid particles dispersed in at least the surface portion of the coating for preparing a matte finish on the sheet material.

3,605,195

MOLD ASSEMBLY FOR CASTING PLASTIC OPTICAL LENSES

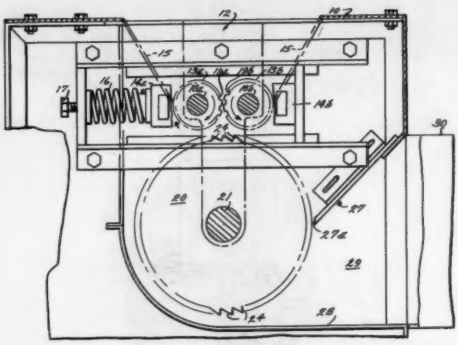
Charles D. Campbell, 3604 Bayonne Drive, Pacific Beach, Calif. 92109

Filed Aug. 24, 1970, Ser. No. 66,228
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. B29c *5/00;* **B29d** *11/00*
U.S. Cl. 18—39 **8 Claims**



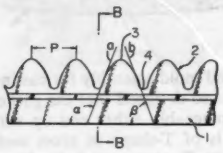
A gasket ring and mold assembly for casting plastic concavo-convex lenses so designed that the gasket ring can be assembled interchangeably either end up without adverse effects. The ring is of T-shape in cross section with the opposite sides of its T-stem oppositely sloped to one another so that either seats against the inner convex surface of the convex upper mold member or against the similarly but oppositely beveled upper rim edge of the lower concave mold member.

3,605,196
FIBER OPENER
Cecil S. Wise, Dallas, and David F. Hullett, Belmont, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.
Filed Oct. 14, 1968, Ser. No. 786,523
Int. Cl. D01g *9/16*
U.S. Cl. 19—83 **5 Claims**



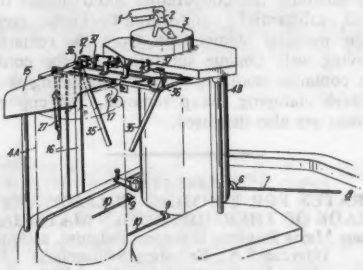
A machine for opening or grinding waste or new fibers or the like in which the fibers to be opened are fed between two oppositely rotating feed rolls, which are spring biased towards each other. If asbestos fibers are being opened, the surfaces of the feed rolls are fluted, otherwise the surfaces of the feed rolls have teeth for use with other types of fibers. The feed rolls serve to hold the fibers while moving them forward to be torn at and opened by the teeth on an opening cylinder of the licker-in type. In the case where teeth are used on the feed rolls, the teeth on one feed roll act to hold onto the fibers while the teeth on the other feed roll clean the spaces between the teeth on the first feed roll and the opening cylinder pulls the fibers apart. The teeth on the opening cylinder are at an angle which causes self-doffing to take place within one revolution of the opening cylinder. A cut-off bar is provided to aid removal of any fibers from the opening cylinder which are not self-doffed.

3,605,197
METALLIC WIRE FOR ROLLER COMB
Moriichi Watanabe, Aichi-ken, Japan, assignor to Nagoya Metallic Card Clothing Co., Ltd., Nishikasugai-gun, Aichi-ken, Japan
Original application Aug. 26, 1968, Ser. No. 755,182. Divided and this application Oct. 20, 1969, Ser. No. 871,798
Claims priority, application Japan, Apr. 19, 1968, 43/25,822
Int. Cl. D01g *15/84*
U.S. Cl. 19—114 **5 Claims**



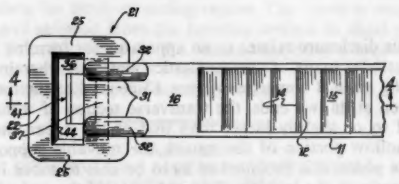
Metallic wire to be mounted on a roller comb for separating fibrous web from a doffer, which consists of an upper working section with saw teeth on the top and a base, the height and pitch of the saw teeth being, respectively, 1–10 mm. and 2–30 teeth per inch, and each tooth being of a configuration defined by a smoothly projecting curve which tangentially contacts with two straight lines meeting the horizontal line extending in the longitudinal direction of the metallic wire, at the angles (α) and (β) of, respectively, 90–150° and 30–90° C.

3,605,198
TEXTILE MACHINES
John K. P. Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland
Filed Mar. 20, 1969, Ser. No. 808,793
Claims priority, application Great Britain, Mar. 27, 1968, 14,796/68
Int. Cl. B65h *54/76*
U.S. Cl. 19—159 **7 Claims**



Apparatus for serving a length of sliver extending between a full can which has just been doffed and an empty can receiving sliver from the output of a sliver preparing machine includes means for clamping the sliver at two spaced points and a severing blade for severing the sliver held between these two points. The clamping means comprises cooperating members one of which is constituted by a horizontal plate formed with a pair of elongated slots and the other of which comprises a pair of pivoted arms movable upwardly into the respective slots so as to clamp the sliver. The severing blade operates through a third slot in the plate so as to move downwardly to sever the sliver.

3,605,199
BUNDLE TIE
Robert Eberhardt, Chicago, Ill., assignor to All States Plastic Manufacturing Co., Inc., Chicago, Ill.
Filed Jan. 8, 1970, Ser. No. 6,013
Int. Cl. B65d *63/00*
U.S. Cl. 24—16PB **4 Claims**



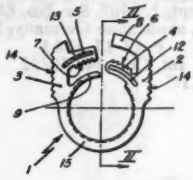
A tie of the type comprising a toothed strap having an apertured head at one end, the other end of the strap being threaded through the head and locked therein by a pawl. The present disclosure relates to improvements in the pawl to obtain a more reliable locking action on the strap.

3,605,200

CLAMP FOR FASTENING TUBULAR ELEMENTS

Michele Vallinotto, Strada San Michele 29, Testona, Moncalieri, Italy, and Luigi Villata, Viale Stazione 6, Moncalieri, Italy

Filed Nov. 21, 1969, Ser. No. 878,929
Claims priority, application Italy, Nov. 23, 1968, 20,059/68
Int. Cl. B65d *63/02*
U.S. Cl. 24—20TT 4 Claims



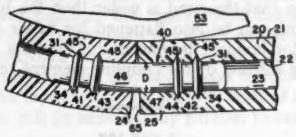
A single-piece resilient clamp for fastening a sleeve or collar on a tubular pipe and shaped like a U. Each branch of the clamp has an inwardly projecting, center-slotted, toothed extension, as well as an inwardly projecting non-toothed extension. The outer surface of each branch is corrugated so as to enable a compression tool safely to cause the engagement of the toothed extensions with each other. Circumferential knurling on the clamp's inner surface ensures the positive fastening thereof on the elements to be tightened.

3,605,201

ENDLESS BELT ASSEMBLY WITH IMPROVED INSERT COUPLING

Arnold G. Peterson, Sunapee, N.H., assignor to L. M. & L. Corporation, Claremont, N.H.

Original application Mar. 25, 1968, Ser. No. 715,869, now Patent No. 3,501,971, dated Mar. 24, 1970. Divided and this application May 26, 1969, Ser. No. 847,759
Int. Cl. F16h *9/00*; F16g *3/07*
U.S. Cl. 24—31C 9 Claims



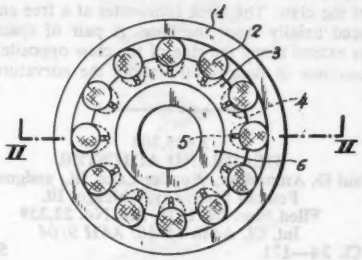
An improved continuous belt assembly suitable for use in high velocity, moderate-load power transmission applications comprising, in combination, a novel internal coupling means and a tough extensible, flexible and tear resistant polymeric belting. The coupling means includes a cylindrical shank with a continuous, circular, external rib having an outer holding edge, proximate each opposite end thereof, such edges being adapted to cut into and grip the interior walls of the belting when the coupling means is inserted into hollow ends of the belting and the belting is subsequently mounted on machinery. When made of rigid material, the sharp edges are joined by a connector shank, or shaft of at least about 20% larger than the inside diameter of the hollow tubular belting, thus providing means for maintaining the outer diameter of the elastomeric belt uniform between the points at which the aforesaid sharp edges cut into the belt. When made of flexible material, the diameter of the connector shank or shaft may be equal to the inside diameter of the tubing.

3,605,202

SYSTEM FOR FIXING CABLES AND RODS SUBJECTED TO STRESS

Ricardo Barredo de Valenzuela, Raimundo Fernandez, Villaverde 45, Madrid 3, Spain

Filed Dec. 11, 1968, Ser. No. 783,077
Int. Cl. F16g *11/00*
U.S. Cl. 24—122.6 4 Claims



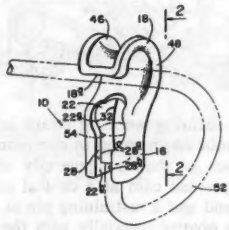
A system for fixing tension members, such as cables and rods, to an anchor device, especially useful for supporting load-bearing tension members which are to be stressed by what is known as a post-stressing process. The basic components of the anchor device are an external crown and an internal crown, both being formed of a hard metal, hard enough to resist a plastic deformation. The two basic components cooperate to form a wedge to clamp the several tension members. A clamping action of the tension members is accomplished by the wedge action between the internal crown and the external crown. The internal crown is formed with a multiplicity of half-round channels to receive the various members which are to be fixed. In the bottom of the channels, grooves are formed in an axial direction in order to allow the internal crown to deflect under the pressure of stressing of the elements, thus imparting some elasticity to the internal crown, whereby, by the effect of the pressure of the wedging action, the channels conform to the lateral surface of the members to be fixed, bringing about an intimate contact. To avoid any undue distortion, due to the elasticity of the internal crown, a distortion limiting ring is inserted in the interior of the crown. In an alternate embodiment, the internal crown is uniformly thick in the axial direction of the tension members, the distortion limiting ring having its outer surface in the form of a cone section.

3,605,203

CLAW

Charles C. Wallace, Portland, Oreg., assignor to West Coast Wire Rope and Rigging of Portland, Inc., Portland, Oreg.

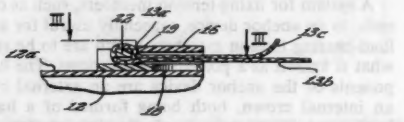
Filed Mar. 14, 1969, Ser. No. 807,313
Int. Cl. F16g *11/14, 11/00*; F16b *45/00*
U.S. Cl. 24—123 2 Claims



A claw for use in hoisting and securing loads including an elongated base adapted to be secured to the end of a line, with the line extending axially outwardly from

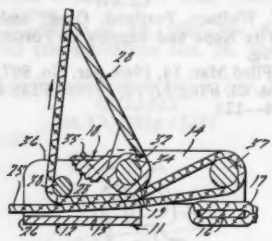
one end of the base, and a hook formed integrally with the base and extending axially outwardly from the other end of the base. The base has a line-receiving passage extending therethrough, a slot on one side of the claw which permits slipping a line into the passage, and means in the passage for securing the line. The hook joins the base on the side of the claw opposite the slot, curves over the axis of the claw to form a saddle, and then extends along a line paralelling the axis of the claw toward the base on the one side of the claw. The hook terminates at a free end which is spaced axially from the base. A pair of spaced-apart flanges extend along the side of the claw opposite the slot and continue in flanges throughout the curvature of the hook.

3,605,204
HEADBAND ADJUSTER
Paul D. Amundsen, Wonder Lake, Ill., assignor to Fendall Company, Chicago, Ill.
Filed Mar. 24, 1970, Ser. No. 22,239
Int. Cl. A44b *11/10*; A61f *9/04*
U.S. Cl. 24—171 **5 Claims**



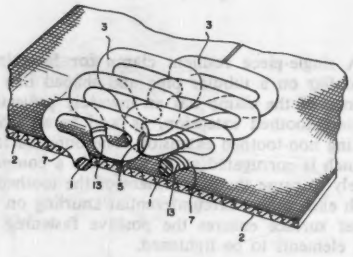
A simple adjustment integrated with the frame of a goggle, or the like and providing means for adjustably attaching a flexible, stretchable, headband, or the like, to the goggle itself in a manner preventing loosening or detachment of the headband from the goggle. A single combination slidable wedge and retainer member is provided in slidable relation with the goggle into a position of tight, fixed, adjustment, or into, alternatively, a position in which relatively free movement of the elastic headband is accommodated. The parts are constructed for one-handed manipulation of the adjusting device while the goggle is on the head of the wearer.

3,605,205
LOW PROFILE BUCKLE
Charles F. Crissy, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.
Filed May 14, 1969, Ser. No. 824,465
Int. Cl. A44b *11/12*
U.S. Cl. 24—191 **1 Claim**



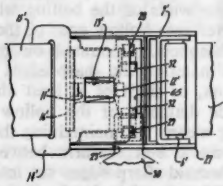
A buckle for securing webbing straps in systems such as are used to hold down cargo in common carriers. The buckle comprises a shallow generally channel-shaped body having a pivoted cam at a central portion thereof, a roller at one end and a restraining pin at the other end. A flat handle is pivoted coaxially with the cam and lifts it with a lost motion connection. The buckle is fastened to one strap and the other strap is fed under the restraining pin and the lifted cam, around the roller and back under the cam and restraining pin. The cam has rows of teeth with a spacing coordinated with the picks in the webbing and is spring-urged toward the strap, the handle being independently spring-urged to a flat position flush with the body. There is therefore no danger of accidentally releasing the buckle by striking the handle.

3,605,206
SLIDE-FASTENER
Alfons Fröhlich, Essen, Germany, assignor to Opti-Holding AG., Glarus, Switzerland
Filed Sept. 2, 1969, Ser. No. 854,432
Claims priority, application Germany, Dec. 27, 1968, P 18 17 134.1
Int. Cl. A44b *19/12*
U.S. Cl. 24—205.1C **10 Claims**



A slide fastener has a slide-fastener half consisting of a support tape and a coupling element in the form of a coil of synthetic resin mounted thereon. The coil has turns which each have a head next to an edge of the tape, a bight opposite the head, an upper shank extending between the head and bight and lying orthogonally to the coil axis, and a lower shank lying on and attached to the tape at an angle to the coil axis. The heads are flattened so that a head of a similar coil can be gripped between neighboring heads. The upper shank can be inclined to the tape so that the head is wider than the bight and the lower shank can be also flattened for better contact with the tape for bonding thereto or for creating a formation preventing shifting of the coupling element relative to the tape.

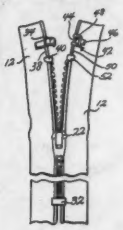
3,605,207
SAFETY BELT BUCKLE
James E. Glauser, Santa Ana, and Don L. Frisk, Orange, Calif., assignors to Pacific Scientific Company, City of Commerce, Calif.
Original application Aug. 14, 1967, Ser. No. 660,335, now Patent No. 3,520,034, dated July 14, 1970. Divided and this application July 14, 1969, Ser. No. 859,220
Int. Cl. A44b *17/00*, *11/26*
U.S. Cl. 24—205.17 **1 Claim**



A safety belt having a buckle provided with latching means for intially interconnecting two seat belt sections

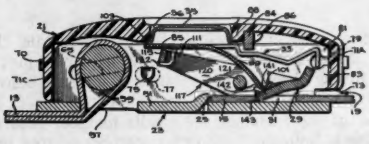
and thereafter providing for connecting additional sections such as shoulder straps and crotch straps, the latching means automatically latching the sections when attached but permiting detachment of auxiliary sections without detaching the main seat belt sections.

3,605,208
MOLDED CLASP FOR SLIDE FASTENERS
Alfred E. Carlile, Meadville, Pa., assignor to Textron Inc.
Filed Mar. 10, 1969, Ser. No. 805,554
Int. Cl. A44b *19/36, 19/00, 13/00*
U.S. Cl. 24—205.11 **7 Claims**

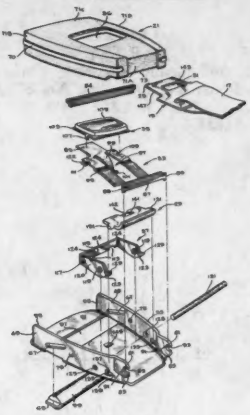


A molded hook and eye clasp and method of making the same for a slide fastener which includes a series of interengagable fastener elements carried at the opposed marginal edges of a pair of tapes. At gapped portions of the slide fastener chain, a hook member, an eye member, top stops and a bottom stop for successive slide fasteners are formed, with the beaded edges of the tapes intermediate the hook and eye members and their respective top stops being impregnated with mold material to provide a stiffened but pliable section for supporting the same. After the mold product is removed and the fastener is in the closed position, the impregnated beaded edges tend to be splayed apart when the slider of the slide fastener is in the closed position. Now, when the hook and eye members are engaged, they act against the forces tending to splay the tapes apart, and the free ends of the tapes of the fastener will lie substantially parallel to each other.

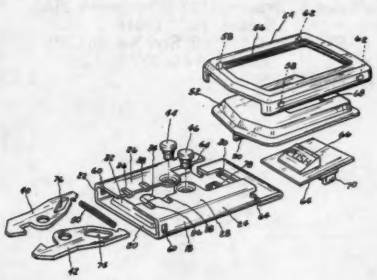
3,605,209
SAFETY BELT BUCKLE
Peter G. Alarcon, Colorado Springs, Colo., assignor to Gateway Industries, Inc.
Filed Feb. 24, 1970, Ser. No. 13,389
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **9 Claims**

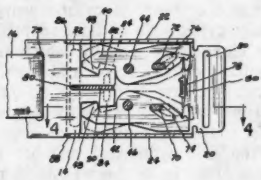


A push button safety belt buckle is provided with a latch dog operating mechanism which is coupled together to remain in working relationship should a cover be removed or broken. The push button operating mechanism is positioned in a cavity in the buckle to permit a considerable inward movement of the push button and to provide a good mechanical advantage so that the push button may be easily operated with a light operating force from women or children.



3,605,210
SIDE LOCKING SEAT BELT BUCKLE
Thomas E. Lohr, Warren, Mich., assignor to Jim Robbins Seat Belt Co., Mount Clemens, Mich.
Filed Apr. 21, 1969, Ser. No. 818,022
Int. Cl. A44b *11/25*
U.S. Cl. 24—230 **4 Claims**

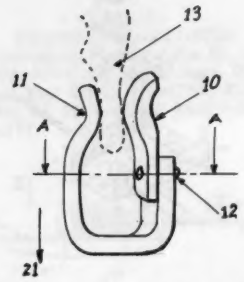




A safety seat belt buckle having a pair of locking members which engage opposite side edges of a plate-like tongue to prevent its removal from a latched position in the

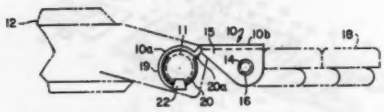
buckle. A release member on the buckle is connected to the locking members such that they can be moved toward release positions either by a motion of the release member, or by contact with the tongue as it is received toward its latched position.

3,605,211
EAR CLIP
Eugene Grosz, 387 Grand St., New York, N.Y. 10002
Filed Nov. 24, 1969, Ser. No. 879,095
Int. Cl. A44c 7/00
U.S. Cl. 24—248JE 1 Claim



An ear clip for fastening the ear ring proper to the ear comprising no springs but having a clamping leg (of ordinary material, metal or others) which can be positioned to the desired clamping pressure where it can lock itself against accidental opening, by a construction which causes the clamping leg to exert its pressure indirectly, its movement being side ways instead of perpendicular.

3,605,212
COUPLING FOR WATCHBAND AND THE LIKE
Mates A. Bruner, 1113 Wynnbrook Place, Secaue, Pa. 19018
Filed Oct. 14, 1969, Ser. No. 866,325
Int. Cl. A44c 5/18
U.S. Cl. 24—265WS 8 Claims

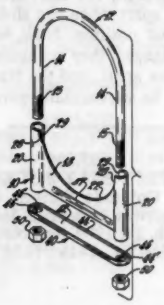


A coupling for releasably attaching a watchband or the like to a watch or other piece of jewelry comprises a first, generally cylindrical portion adapted to releasably engage an elongated pin on the watch and a second portion which may be fixed or releasably secured to the end of the band. The first portion has an inner partially cylindrical portion which is normally rotatable against the inner surface. In one position the inner cylindrical member and the first cylindrical member encircle the elongated pin whereas in its open position the coupling can be detached from the pin. The second portion is constructed with two ears having aligned apertures respectively located therein which engage a spring-loaded pin in the end of the watchband thereby enabling the coupling to be released from the band if desired.

3,605,213
BAND OR HOSE CLIPS
David Lilley Turner, Coventry, England, assignor to National Research Development Corporation, London, England
Filed Dec. 10, 1969, Ser. No. 883,835
Claims priority, application Great Britain, Dec. 11, 1968, 58,799/68
Int. Cl. B65d 63/02
U.S. Cl. 24—274R 8 Claims

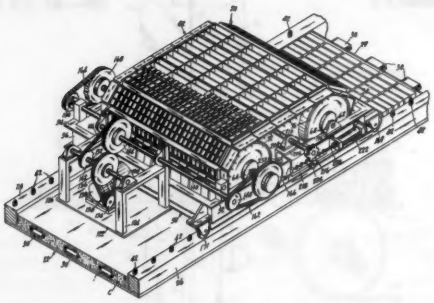
A hose clip includes a band which is threaded adjacent one end and has a mounting for a screw at the other end. The mounting includes a pair of parallel side walls and an inclined face which extends across the band and the mounting is formed by deforming said other end of the band. The screw has a conical portion and a spigot extends from the apex thereof and engages in an aperture in the inclined face.

3,605,214
CLAMP FOR TUBING
Kenneth L. Spotts, Ottawa Lake, Mich., and Richard W. Tabbert, Toledo, Ohio, assignors to Questor Corporation, Toledo, Ohio
Filed July 17, 1970, Ser. No. 55,755
Int. Cl. B65d 63/00
U.S. Cl. 24—277 15 Claims



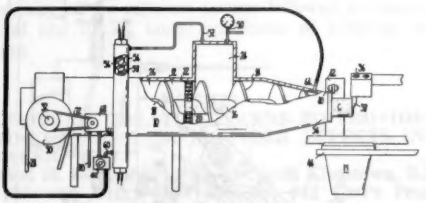
The disclosure embraces a U-bolt and saddle clamp construction of the character employed for clamping sections of tubing in telescoped relation, the clamp construction embodying a reinforcing tray or connector to resist distortion of the metal of the saddle member embracing legs of the U-bolt, the reinforcing member or tray having openings accommodating the legs of the U-bolt with the surface regions adjacent the openings having radially disposed indentations or recesses engaged by the securing nuts to resist loosening of the nuts.

3,605,215
SURFACING APPARATUS AND METHOD
James Matson Young, 3402 W. Wells St. 53208, and George O. Whitney, 5141 N. 27th St. 53209, both of Milwaukee, Wis.
Filed Aug. 19, 1968, Ser. No. 753,500
Int. Cl. B28b 7/00
U.S. Cl. 25—1R 29 Claims



A surfacing machine is provided for embedding or implanting a plurality of objects in the exposed surface of a bed of cementitious material. The machine is coupled to a form in which the bed is formed and includes an endless track which moves in an orbital path above the exposed surface. The track is suitable for receiving the plurality of objects at one station along its orbital path and for depositing the objects in the exposed surface at a second station in the path. Means are provided to embed the objects in the surface of the bed.

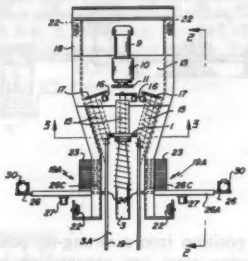
3,605,216
MANUFACTURE OF POTTERY WARE
Arthur Bradshaw, Stoke-on-Trent, England, assignor to Service (Engineers) Limited, Stoke-on-Trent, England
Filed Mar. 6, 1968, Ser. No. 710,985
Claims priority, application Great Britain, Mar. 14, 1967, 11,786/67
Int. Cl. B28b 3/22
U.S. Cl. 25—14 4 Claims



The invention relates to means and method for dispensing uniform pieces of clay from an intermittently operating extruding device to which superheated steam is introduced to raise the temperature of the clay. The quantity of clay extruded and cut-off to form each piece and the heat content of the steam introduced to the chamber can be varied independently, and temperature control means is provided to vary the heat content of the steam to compensate for variations in the temperature of the extruded clay.

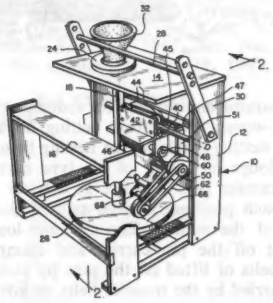
The invention further relates to the incorporation of the extruding device in an automatic plant for the production of pottery articles, for example cups.

3,605,217
PILE EXTRUDER
Ernest Martens, 75 Noble Ave.; Adalbert Groll, 346 Edward Ave.; and Frederick Maxwell Hewitt, 349 Kingston Crescent, all of Winnipeg, Manitoba, Canada; and Ambros Leithner, Manitoba, Canada
Filed Oct. 21, 1968, Ser. No. 801,214
(Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. B28b 3/22
U.S. Cl. 25—14 18 Claims



A stapling attachment is secured upon each side of a pile extruding machine so that U-shaped reinforcing staples can be inserted upon each side of the pile at spaced intervals therealong, as the pile is being extruded. Also the extruding machine is in two portions, a power unit and an auger unit thus enabling the relatively expensive power unit to be used on different beds or pallets.

3,605,218
POTTER'S WHEEL WITH VARIABLE SPEED DRIVE ARRANGEMENT
Peter D. Rasmussen, 3608 W. Capitol Drive 53216, and Richard E. Schulze, 8842 W. Custer Ave. 53225, both of Milwaukee, Wis.
Filed Dec. 8, 1969, Ser. No. 883,023
Int. Cl. B28b 1/02
U.S. Cl. 25—24 10 Claims

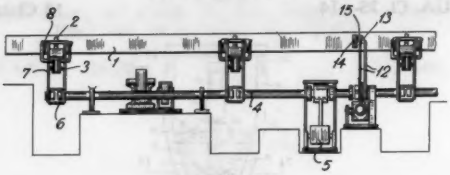


A potter's wheel having a motor connected through a friction drive in turn engageable with the kick wheel at various radial locations for providing a variable speed motor drive for the potter wheel.

3,605,219
PLANT FOR CASTING BUILDING COMPONENTS
Bent Hauberg, Birkerod, Denmark, assignor to A. Jespersen & Son International A/S, Copenhagen, Denmark
Filed July 8, 1968, Ser. No. 743,247
Int. Cl. B28b 7/00
U.S. Cl. 25—41R 18 Claims

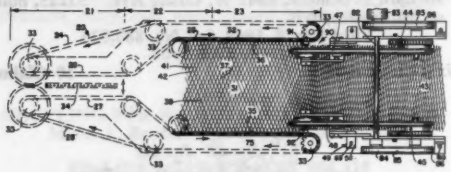
A semi-automatic plant for casting building components in which horizontal moulds having swingable side walls are conveyed past a number of stations for shuttering,

pouring, hardening, removing of the shuttering and cleaning. The shuttering station and the station for removing the shuttering are provided with swing arms driven by a common shaft and adapted to swing the side walls from



a swung-out position into a swung-up position and vice versa. The swing arms are cooperating with swingable spring bows mounted on the mould bottom and adapted to lock the side walls in swung-up position and to carry them in swing-out position.

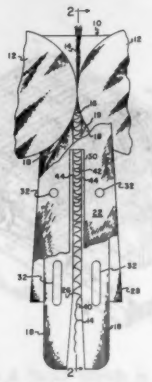
3,605,220
APPARATUS FOR CHANGING THE MESH SIZE OF NON-WOVEN NETTING
Lamar T. Atwood and Lester Gidge, Nashua, N.H., assignors to Union Carbide Corporation
Filed July 10, 1967, Ser. No. 652,337
Int. Cl. B32b *5/08, 31/00;* **D04b** *3/10*
U.S. Cl. 28—1 **9 Claims**



An apparatus and method for reducing the size of mesh in a non-woven, criss-cross, netting advancing along a path in a netting machine, the netting being carried by its selvedge loops on a pair of pin type carriers. A pair of endless transfer belts advance at a lesser speed than the netting, each positioned under one of the selvedge loop portions of the netting. The selvedge loop portions are either cut off the pin carrier and clamped against the transfer belts or lifted off the pins by elongated stripping fingers carried by the transfer belts, to advance therewith.

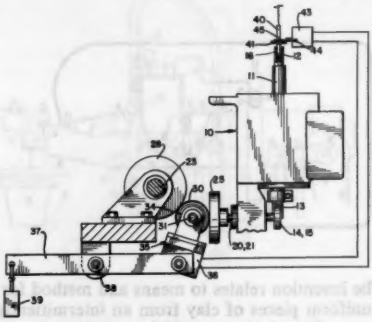
3,605,221
STUFFER BOX CRIMPING AND METHOD THEREFOR
Jack C. Binford, Fredrick A. Ethridge, and James R. Talbot, Charlotte, N.C., and Deryk W. Harrison, Greenville, S.C., assignors to Fiber Industries, Inc.
Filed Aug. 8, 1969, Ser. No. 848,495
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **12 Claims**

A stuffer box crimper and method for crimping filamentary material, particularly yarns of continuous synthetic organic filaments, wherein the yarn is crimped and uniformly withdrawn from the crimper with a minimum of tension variation. Yarn fed to the apparatus is compacted against doctor blades which form opposing sidewalls of the stuffer chamber and front and back plates which complete the stuffer chamber. The yarn proceeds through the chamber packed against the confining doctor blades. The doctor blades diverge a predetermined friction-reducing amount while back pressure producing means in the front and/or back plate called stabilizers, converge on the confined yarn in the chamber in a direction generally parallel to the doctor blades and at an



angle of 45 to 135 degrees thereto, thereby changing the frictional impediment on the yarn from the doctor blades to the stabilizer. The co-action of the doctor blades and the stabilizer results in the free release of crimped yarn from the chamber in a smooth manner, theerby reducing variations in the yarn to a level suitable for the piece dyeing of products produced therefrom with a minimum of dye variability.

3,605,222
VARIABLE FRICTION DRIVE FOR STUFFER CRIMPER
Charles R. Cabello, Wilmington, Del., assignor to Joseph Bancroft & Sons Co., Wilmington, Del.
Filed Oct. 3, 1969, Ser. No. 863,514
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.7 **11 Claims**



A variable friction drive for the feed rolls or the winder rolls of a stuffer crimper including a driving roll driven at a constant speed, a driven member mounted to drive said rolls and having areas of different radii, an idler member inter-connecting the driving roll and the driven member and shiftable to engage the driven member at areas of different radii for varying the drive ratio.

A switch actuated by a member that senses the level of the core of crimped yarn in the crimper is connected

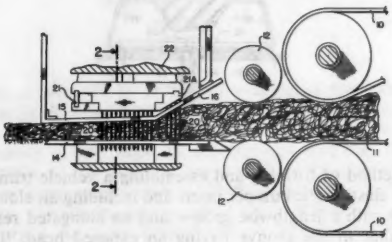
to shift the position of the idler member to vary the drive ratio so as to maintain the core at a uniform level in the crimper.

3,605,223

APPARATUS FOR FELTING NON-WOVEN WEBS

Hermann Barth, Eberbach (Neckar), Germany, assignor to Richard Dilo, Eberbach (Neckar), Germany

Filed Nov. 26, 1969, Ser. No. 880,090
Int. Cl. D04h *18/00*
U.S. Cl. 28—4R 4 Claims



Felting apparatus for a non-woven web having a bed plate over which the web is fed and two banks of needles to penetrate the web for felting the fibers. An upper plate with a flared entrance guides the web in the felting station for reducing the web bulk as it enters. Both, stripper and bed plate have aligned holes to pass the needles of the main bar in their penetrating stroke, and a secondary needle bar in the flared entrance section, which does not penetrate the bed plate.

3,605,224

BULKING METHOD

Jesse L. Riley, William John Robert, and Walter C. Zybko, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed July 28, 1969, Ser. No. 845,503
Int. Cl. D02g *1/00*
U.S. Cl. 28—72.1 22 Claims

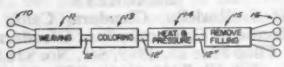
A process for crimping cellulose acetate/cellulose triacetate conjugate filaments by treatment with reagents which preferentially disrupt the molecular orientation and crystallinity of the cellulose acetate followed by reagent removal and drying under conditions of substrate relaxation.

3,605,225

METHOD OF TREATING YARNS TO PROVIDE KINKING AND/OR MOTTLED EFFECTS IN FABRIC

Kirkland H. Gibson, Pojac Point, North Kingstown, R.I. 02852, and Henry E. Protzmann, 941 Carr's Pond Road, East Greenwich, R.I. 02818

Filed Aug. 26, 1969, Ser. No. 853,042
Int. Cl. D04b *19/00*
U.S. Cl. 28—72.16 6 Claims



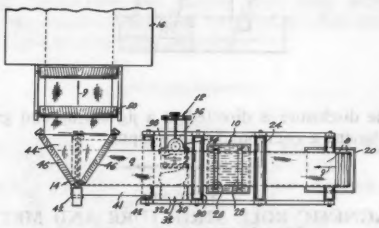
The placing of a plurality of yarns into a woven fabric form of a type where the filling yarn may be easily unwoven so as to treat the warp yarns either by means of a color, bulking, or setting into a kinked effect or all of them and then unweaving the woven fabric to provide a plurality of similarly treated yarns for reworking into various forms such as fabrics.

3,605,226

METHOD FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, 605 Dorais St., St. Laurent, Quebec, Canada

Filed July 8, 1968, Ser. No. 743,179
Claims priority, application Great Britain, July 11, 1967, 31,897/67
Int. Cl. D06c *5/00, 27/00*
U.S. Cl. 28—74 1 Claim



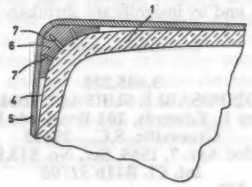
A method of continuously treating a tubular fabric through an impregnating solution, then slitting the fabric, opening the slit fabric and drying it.

3,605,227

METHOD OF MANUFACTURING AN IMPLOSION-FREE DISPLAY TUBE

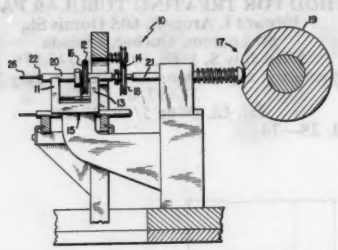
Willem Fokko Nienhuis, Georg Arnold Spanhoff, and Jacob Willem, Emmasingel, Eindhoven, Netherlands, and Klaus Böke, Brand am Hang, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Original application Sept. 15, 1967, Ser. No. 668,066. Divided and this application May 19, 1969, Ser. No. 850,275
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.13 3 Claims



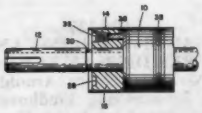
A method of making an implosion-free display tube by fitting an annular clamping strap around the outer periphery of the bulb. The strap has an inner periphery equal to or greater than that of the bulb. By pressing wedge-shaped spacing members in the corners between the strap and the bulb to stretch the strap, uniform tensile stresses are provided within the strap. Securing the members and straps to the bulb by means of an adhesive completes the process. Other spacing members may be used to stretch the strap in the flat sections of the tube.

3,605,228
COMPOUND ROTARY INPUT TOOL
John A. Cupler II, 10 Cupler Drive, La Vale, Cumberland, Md. 21502
Original application Mar. 25, 1968, Ser. No. 715,711, now Patent No. 3,478,419, dated Nov. 18, 1969. Divided and this application Oct. 27, 1969, Ser. No. 869,733
Int. Cl. B24b *39/00*
U.S. Cl. 29—90 2 Claims



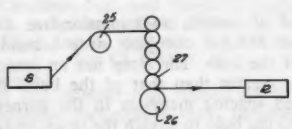
The disclosure is directed to a jig boring and grinding tool having a compound rotary input.

3,605,229
MAGNETIC ROLL STRUCTURE AND METHOD OF CONSTRUCTING SAME
James E. O'Neal, Cecil R. Attaway, and Josef K. Gunter, Durham, N.C., assignors to Gunter & Cooke, Inc., Durham, N.C.
Filed Feb. 19, 1970, Ser. No. 12,818
Int. Cl. B21b *31/08*
U.S. Cl. 29—125 14 Claims



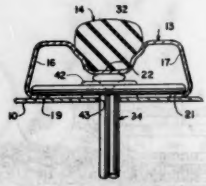
A magnetic roll structure incorporating permanent magnet modules disposed concentrically within a tubular shell and supporting the same solidly through a filling of hardened adhesive within the shell about each magnet module, the adhesive being characterized by low viscosity prior to hardening, by hardening without release of volatile products, and by insignificant shrinkage upon hardening.

3,605,230
DISPOSABLE SURFACE ROLL
Mary L. Edwards, 201 Brookside Way, Greenville, S.C. 29605
Filed Apr. 7, 1969, Ser. No. 813,988
Int. Cl. B21b *31/08*
U.S. Cl. 29—130 11 Claims



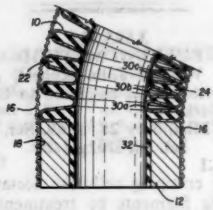
A roll structure having a plurality of removable layers closely fitting over a rigid core with means for removing the outer layers as they become abraded or soiled.

3,605,231
METHOD OF MAKING VEHICLE TRIM STRIP WITH ELASTOMERIC BUMPER INSERT
Charles R. Kistner, Pontiac, and Thomas W. Anderson, Troy, Mich., assignors to Textron Inc., Providence, R.I.
Original application Nov. 2, 1967, Ser. No. 680,125, now Patent No. 3,517,473, dated June 30, 1970. Divided and this application Jan. 19, 1970, Ser. No. 8,149
Int. Cl. B23p *17/00, 11/02*
U.S. Cl. 29—155 2 Claims



Method of forming and assembling a vehicle trim strip with elastomeric bumper insert and including an elongated body with a lengthwise groove and an elongated resilient member in the groove having an exposed head, the resilient member being formed as an elongated extrusion, parts of the extrusion being cut away to form feet, which are anchored in slots along the groove.

3,605,232
METHOD OF LINING FLEXIBLE METAL L'S
Vernon C. Hines, 2915 S. Lafayette Drive, Denver, Colo. 80210
Filed Feb. 17, 1969, Ser. No. 799,618
Int. Cl. B21d *53/00;* B21k *29/00;* B23p *15/26*
U.S. Cl. 29—157.4 10 Claims



The method of lining a 90° elbow made of flexible, metal convolute tubing initially bends a length of flexible convolute tubing into a 90° L-shape, a wire braid covering is then stretched over the outside of the L and welded in place holding the tubing in the L-shape, filling the internal convolutes with the flexible resilient material, removing excess flexible material to expose the apex of the metal convolutes, inserting a removable mandrel in the L, filling the annulus around the mandrel with additional flexible resilient material, and then curing all the flexible material to bond the two materials together and to the metal.

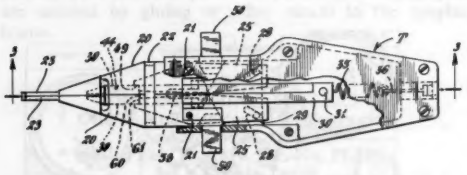
3,605,233
PROCESS FOR MAKING ORTHODONTIC BRACKETS
Raymond S. Rosiello, Glendora, Calif., assignor to Radontic of California, Inc., Glendora, Calif.
Filed June 26, 1969, Ser. No. 836,837
Int. Cl. B21f *43/00;* B23p *13/00*
U.S. Cl. 29—160.6 10 Claims

A process for making an edgewise orthodontic bracket having a rectangularly bottomed dimensionally critical longitudinal edgewise slot which in use receives a critically dimensioned rectangularly sectioned wire, a wing

extending laterally from the slot which in use is engaged by a ligature wire, and a base pad beneath the slot. The process includes casting a body in a mold having a parting line, the body including said slot formed to its critical dimension, the wings, the base pad, and a longitudinally extending flange. The flange is removed and the remainder of the body is abrasively treated such as by slide honing, to create the product. In a preferred embodiment of the

process, a plurality of groups of said wings are formed, and the body is cut laterally to form a plurality of pieces which are then abrasively treated, and then the flange is removed in two steps. In the first said step the major proportion of the flange is removed, and in the second the remaining minor stem flange is removed by grinding to form a planar surface on the bottom of the base pad, after which the semi-finished strip is cut into segments which are metal-finished, such as by slide honing.

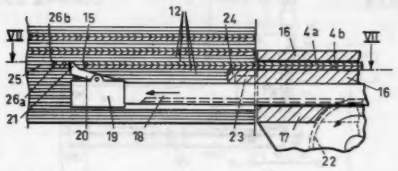
3,605,234
CONTACT INSERTION AND TESTING TOOL
Robert M. Bogursky, Milford, Conn., assignor to Burndy Corporation
Filed Nov. 24, 1969, Ser. No. 879,326
Int. Cl. H01r *43/00*; B25b *27/02*
U.S. Cl. 29—203H **17 Claims**



A tool for inserting a contact into a connector, and to test whether or not the insertion is complete. The tool has a pair of jaws for pushing the contact into the connector. It has also a pair of grippers for gripping the conductor. After the contact is inserted into the connector, the tool is pulled in a direction to pull the conductor and the contact away from the connector. The tool can move a short distance relatively to the grippers, while stressing a spring. This exerts a yielding pull on the conductor for a short distance, after which the grippers, if they have not already pulled the contact out of the connector, are released from the conductor automatically.

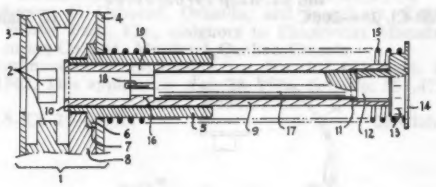
3,605,235
DEVICES TO INTERCONNECT PARTS OF A DIVISIBLE LAMINATED MAGNETIC CORE STRUCTURE FOR A TRANSFORMER OR A CHOKE COIL OF GREAT POWER
Gerardus W. C. van der Horst, Berg en Dal, Netherlands, assignor to Smit Nijmegen Electrotechnische Fabrieken N.V., Nijmegen, Netherlands
Filed Jan. 27, 1969, Ser. No. 794,295
Claims priority, application Netherlands, Feb. 19, 1968, 6802295
Int. Cl. H01r *19/04*
U.S. Cl. 29—203L **5 Claims**

A device to drive strip-shaped coupling laminations home into the spaces left between laminations protruding towards each other and forming part of two parts to be interconnected of a magnetic core for a transformer or a choke coil, said device comprising a guiding shaft



for guiding and a driving mechanism for moving said coupling laminations, said guiding shaft being provided with fixing members which are arranged in offset relation to the discharge opening of said shaft.

3,605,236
ASSEMBLING AND POSITIONING DEVICE FOR COAXIAL ELECTRICAL CONTACTS
Augustin Bouckaert, Oosterzele, Belgium, assignor to Burndy Corporation, Norwalk, Conn.
Filed Dec. 11, 1968, Ser. No. 782,967
Int. Cl. H01r *43/04*; H05k *13/00*
U.S. Cl. 29—203D **8 Claims**

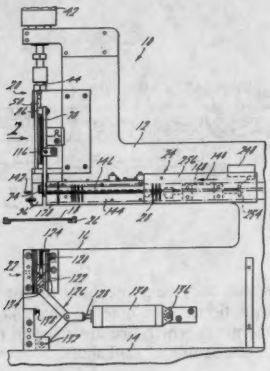


A device for positioning the inner and outer elements of a coaxial electrical contact assembly relative to one another, and for locating the assembled elements in proper position relative to a crimping die assembly. A tubular sleeve, fixed in position relative to a crimping device, serves as a guide for a slidable bushing which is spring-biased toward one end of the sleeve. Fixed, as well as removable, stop members within the bushing provide relative positioning for inner and outer contact elements which can be inserted coaxially into the bushing for assembly. A window aperture in the bushing wall permits visual examination for proper positioning, and the spring biasing allows displacement of the bushing between assembling and crimping positions.

3,605,237
APPLICATOR FOR MOUNTING WIRE WRAP PINS ON CIRCUIT BOARDS
Johannes C. W. Bakermans, Etters, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.
Filed Aug. 25, 1969, Ser. No. 862,591
Int. Cl. H01r *43/04*
U.S. Cl. 29—203D **13 Claims**

Apparatus for mounting a pin on a circuit board in which the pin is fed to a position in approximate alignment with a punch, following which the pin is aligned

accurately with the punch by a pair of clamps and the punch is moved toward the pin to pick up the pin. The

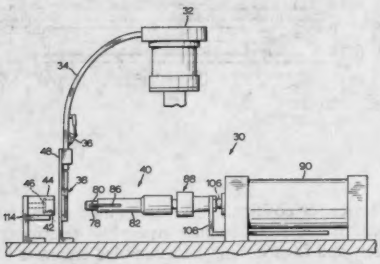


clamps open and further movement of the punch secures the pin to the circuit board.

3,605,238
APPARATUS FOR INTERNAL INSTALLATION OF RESILIENT SEALS

Harald Eschholz, Islington, Ontario, Canada, assignor to Dick Gordon Rockwell, King, Ontario, Canada

Filed Jan. 16, 1970, Ser. No. 3,542
Claims priority, application Great Britain, Jan. 18, 1969, 3,009/69
Int. Cl. B23p *19/02, 19/04*
U.S. Cl. 29—208C **12 Claims**



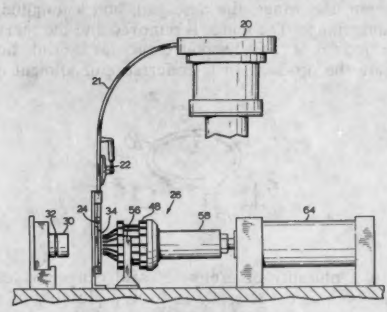
An apparatus for inserting annular resilient components such as seals into a groove formed in an internal opening. The apparatus includes a feeder mechanism which feeds the components to a positioning head to locate the components for an applicator mechanism. One component is picked up for each cycle of the applicator mechanism which carries the component on a pair of fingers into the opening. A sleeve then pushes the component off the fingers and into the groove into the opening.

3,605,239
APPARATUS FOR EXTERNAL INSTALLATION OF RESILIENT SEALS

Harald Eschholz, Islington, Ontario, Canada, assignor to Dick Gordon Rockwell, King, Ontario, Canada

Filed Jan. 16, 1970, Ser. No. 3,544
Claims priority, application Great Britain, Jan. 18, 1969, 3,008/69
Int. Cl. B23p *19/02, 19/04*
U.S. Cl. 29—208C **11 Claims**

An apparatus for automatically installing distensible annular components such as O-rings seals onto a shaft or the like. A feeding mechanism transports the seal to a positioning head where it remains until an applicator mechanism picks it up and stretches it. The seal is then transported over the shaft and once it is in position it is

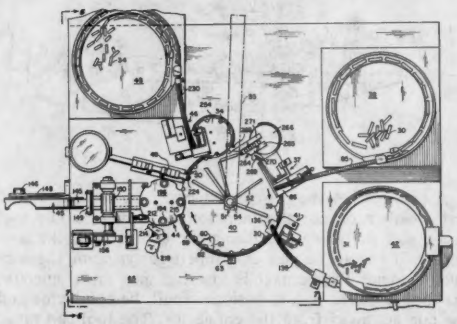


stripped automatically from the applicator mechanism whereupon the seal contracts about the shaft in the required position.

3,605,240
SWAB CUTTING, FORMING, AND ASSEMBLING MECHANISM

Carl F. Avery, Jr., Ernest A. Pearson, and Lloyd V. Winters, Rockford, Ill., assignors to Medical Supply Company, Rockford, Ill.

Original application Dec. 7, 1966, Ser. No. 599,841, now Patent No. 3,461,535, dated Aug. 19, 1969. Divided and this application Mar. 12, 1969, Ser. No. 806,591
Int. Cl. B23p *19/04;* **B23q** *7/10*
U.S. Cl. 29—208B **15 Claims**

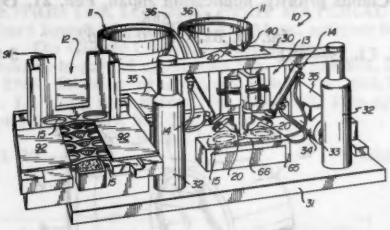


This mechanism is shown incorporated in a rotary machine having a round table that is indexed from station to station, receiving at one station a tubular holder for a swab, into which is fed at another station a cylindrical swab, which, prior to the insertion, is cut to flat generally rectangular form from a strip of absorbent material fed from a reel to a predetermined length and, by movement against the center thereof of the rounded end of a cylindrical plunger into the bore of a tubular former, the strip is formed into a cylindrical shaped swab with a rounded dome at one end. The swab is later ejected directly into the bore of a tubular holder with the rounded dome end projecting. A droplet of liquid solvent is added at another station, which, before its evaporation, helps to cement the swab in place in the holder by rendering tacky a plastic coating on the inside of the holder at the open end. A tubular cap or cover is thereafter applied at a subsequent station, after which the completed article is discharged at another station.

3,605,241
METHOD AND APPARATUS FOR SECURING PADS TO EYEGLASS FRAMES

Stanley J. Fisk, Niagara Falls, Ontario, Canada, assignor to Automation Devices, Inc., Fairview, Pa.

Filed May 28, 1969, Ser. No. 828,539
Int. Cl. B23p *19/04*; B29d *12/02*
U.S. Cl. 29—208 12 Claims

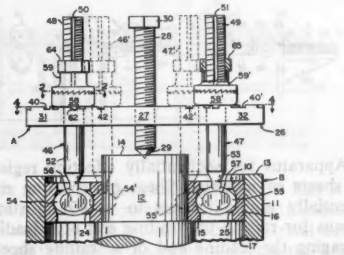


A method for transporting and positioning the nose pads for an eyeglass frame at the proper angle for securement, subsequently rotating the same along the axis for centering the V-notch nose portion of the eyeglass frame, and then moving the eyeglass frame into position for gluing by moving the eyeglass frame to engage the nose pads. The apparatus contemplates a reciprocating sliding clamp assembly with rotatable pairs of jaws for holding the nose pads oriented for rotation on an axis perpendicular to that of reciprocation of the assembly. The jaws are actuated by a centering device when moved into engaged relationship therewith, the centering device positioning the jaws and their nose pads immediately above the eyeglass frames, the frames then being moved upwardly into contact with the nose pads and thereafter the nose pads are secured by gluing or other means to the eyeglass frame.

3,605,242
BALL BEARING PULLERS

Otto E. Kuffner, Box 116, Glentworth, Saskatchewan, Canada

Filed Feb. 16, 1970, Ser. No. 11,523
Int. Cl. B23p *19/04*
U.S. Cl. 29—259 2 Claims

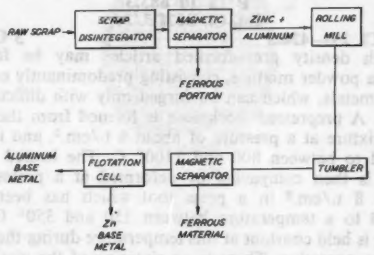


Disclosed is a pulling tool for removing ball bearing assemblages from shaft ends within tubular axles housings. The pulling tool includes a cross member through the central portion of which is threaded a bolt provided with a tip engageable with a shaft end coaxial with the tubular housing. The cross member has bifurcated opposite arm portions through which selected pull rods extend with provisions for adjustment radially and in the direction of the shaft axis. The pull rods are in sets of various sizes and have ellipsoidal knobs which may be brought into gripping engagement with the curved surfaces of inner and outer races of the ball bearing assemblages.

3,605,243
SCRAP RECOVERY PROCESS

Thomas H. Oster, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 18, 1969, Ser. No. 808,204
Int. Cl. B23q *17/00*
U.S. Cl. 29—403 4 Claims

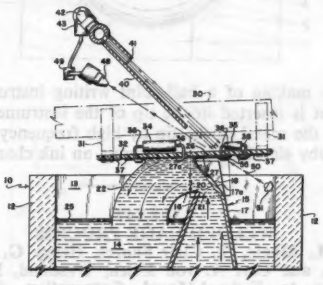


This disclosure is directed to a process for the separation of zinc and aluminum base scrap from the usual impurities accompanying such scrap. Such impurities are usually ferrous metal and copper base metals such as brass and bronze. Aluminum and zinc scrap is preferably first ground and so reduced in size and then flattened by passage through sturdy rolls to reduce it in thickness and simultaneously expedite its separation from ferrous and copper base impurities.

3,605,244
SOLDERING METHODS AND APPARATUS

Solomon C. Osborne, Orlando, and Joseph D. Keller, Winter Park, Fla., assignors to Electrovert Manufacturing Co. Ltd., Montreal, Quebec, Canada

Continuation of application Ser. No. 222,453, Sept. 10, 1962. This application Apr. 20, 1966, Ser. No. 551,475
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 23 Claims

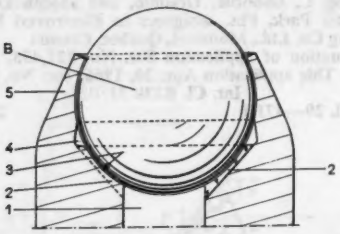


This invention relates to an automatic soldering machine particularly designed for use in connection with the manufacture of printed circuit boards or the like, which utilizes nozzle means for projecting molten solder in a curvilinear stream having an upper surface presenting a crest above the level of the nozzle, and to one side thereof. Upon the undersurface of the item to be soldered being brought into contact with the stream of solder, the effective soldering of the components is brought about. Means are provided for applying a thin film of oxidization-preventing oil over the curved upper surface of the solder stream, and additionally, the arrangement may include means for subjecting the completed circuit board to a flow of refrigerated gas that serves to quickly extract heat, thus preventing formation of excessively crystalline or grainy solder joints.

3,605,245
PROCESS FOR MANUFACTURING HIGH DENSITY PRESS-FORMED ARTICLES
Gerhard Zapf, Krebsoge, Germany, assignor to Sintermetallwerk Krebsoge G.m.b.H., Krebsoge, Rhineland, Germany
No Drawing. Filed Oct. 8, 1969, Ser. No. 864,902
Claims priority, application Germany, Nov. 26, 1968, P 18 10 883.3
Int. Cl. B22f 3/24
U.S. Cl. 29—420.5 3 Claims

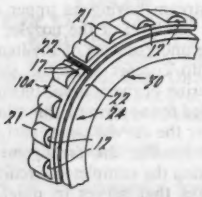
High density press-formed articles may be formed from a powder mixture, consisting predominantly of high alloy metals, which can be forged only with difficulty, if at all. A prepressed workpiece is formed from the powder mixture at a pressure of about 6 t./cm.², and is then heated to between 800 and 1100° C. The heated workpiece is then compacted or deformed at a pressure of about 8 t./cm.² in a press tool which has been preheated to a temperature between 150 and 350° C. and which is held constant at this temperature during the compacting operation. There is no sintering of the workpiece in the press tool. The resultant press-formed article may then be annealed in a vacuum for 4 to 5 hours at 1250° C.

3,605,246
PROCESS FOR MAKING BALL-POINT WRITING INSTRUMENTS
Edmond Regnault, Valence, France, assignor to Etablissements Regnault S.A., Valence, Drome, France
Filed Feb. 14, 1969, Ser. No. 799,412
Claims priority, application France, Apr. 8, 1968, 22,234
Int. Cl. B23p 11/00
U.S. Cl. 29—441 7 Claims



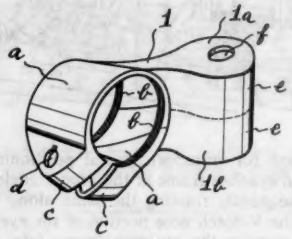
In the making of a ball-point writing instrument, the ball-point is inserted in the tip of the instrument by deforming the metal of the tip by high frequency hammering thereby simultaneously forming an ink chamber.

3,605,247
WELDED CAGE PROCESS
Gerald L. Bingle, St. Clair Shores, Henry G. Steil, Jr., Utica, and Carl A. von Essen, Westland, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Sept. 9, 1968, Ser. No. 758,467
Int. Cl. B23k 31/02
U.S. Cl. 29—477 6 Claims



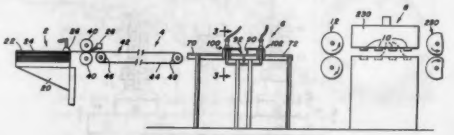
A process for making a cage for bearings in which the cage has a plurality of windows formed in a flat strip which is then cut to length and formed into a circular shape and welded by means of an electron beam.

3,605,248
METHOD OF PRODUCING BICYCLE LUGS
Saburo Yoshikawa, Tokyo, Japan, assignor to Nitto Handle Works Co., Ltd., Tokyo, Japan
Filed May 19, 1969, Ser. No. 825,535
Claims priority, application Japan, Feb. 21, 1969, 44/12,586
Int. Cl. B23k 1/20, 31/02
U.S. Cl. 29—482 5 Claims



This disclosure is to produce various shapes of lugs for use in the handle of a bicycle by separately producing the upper and lower parts of a lug having substantially the same shape from a plate and electrically welding said parts at their joined portion and effect the automation of the manufacture of the lug by automatically introducing the stamped plates into the subsequent steps by providing metal molds in all process steps for stamping and a transfer unit in a press.

3,605,249
REGISTERED JOINDER OF SHEET
Howard R. Kutcher, Allison Park, and Robert M. Trimble and Selmer G. Von Stocker, Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed July 22, 1969, Ser. No. 843,686
Int. Cl. B23g 3/00; B23p 19/00, 19/04
U.S. Cl. 29—429 17 Claims

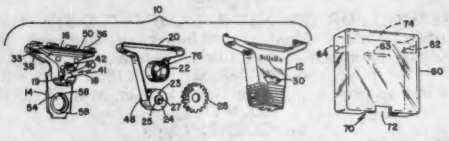


Apparatus for sequentially effecting registered joinder of sheets of material. Sheet transporting means for sequentially moving sheets to a joining station, registry means for raising the trailing end of a leading sheet and engaging the leading end of a trailing sheet. First sheet clamping means disposed rearwardly of the registry means and second sheet clamping means disposed forwardly of the registry means. Joining means for establishing the joint while the sheets are clamped in registered position and control means for coordinating operation of the clamping means and the joining means. The registry means has a vertically reciprocating registry bar provided with sheet engaging faces. Operating means connecting the clamping means with the registry bar to establish movement of the registry bar responsive to movement of the clamping means.

A method of effecting registered joinder of sheets of material. Automatically feeding a sheet forwardly into contact with registry means. Simultaneously raising the

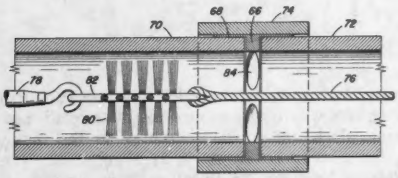
trailing end of a forwardly disposed sheet at the registry means. Clamping the sheets in registered position and securing fastening means to the clamped sheets. Unclamping the joined sheets and moving them forwardly to a position in which the trailing sheet becomes the leading sheet for the next cycle of operation.

3,605,250
METHOD FOR LOADING STRIP MATERIAL
Richard Joseph Maguire, Scituate, Mass., assignor to The Gillette Company, Boston, Mass.
Continuation-in-part of application Ser. No. 586,840, Oct. 14, 1966. Division of application Ser. No. 666,750, Sept. 11, 1967, now Patent No. 3,500,528. This application May 1, 1969, Ser. No. 844,692
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—429 **6 Claims**



A method of loading an elongated strip in a cartridge component having a supply position, a take up position and an operative station through which the strip is to pass includes the steps of fastening a first portion of the strip at the supply position, gripping the strip at a point remote from the first portion, rotating the cartridge component in a direction to bring the operative station and the strip together, and continuing rotation until a second portion of the strip is at the take up position.

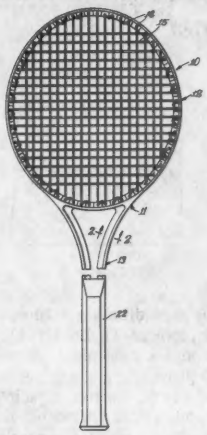
3,605,251
METHOD AND DEVICE USED IN INSTALLING CABLES IN CONDUITS
Phillip Salerno, Brooklyn, and Michael Sammaritano, Bayshore, N.Y., assignors of fractional part interest to Angelo Raffa
Filed Mar. 27, 1970, Ser. No. 23,346
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 **3 Claims**



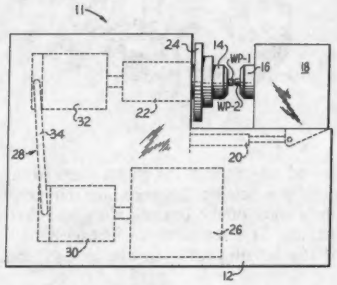
A conduit in which an electrical cable or the like is to be installed has rupturable containers of lubricant installed therein. The containers are broken as the electrical cable is passed through the conduit thereby to release the lubricant in the conduit and reduce the friction of the electrical cable and otherwise facilitate pulling of the cables through the conduit.

3,605,252
METHOD OF FORMING A TENNIS RACQUET
Samuel W. Landsman and Joseph A. Woltering, Chicago, Ill., assignors to Midland Sporting Goods Company, Inc.
Filed Feb. 7, 1969, Ser. No. 797,591
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 **5 Claims**

A method of forming a tennis racquet structure or the like by casting the structure from fused metal under a preselected high pressure suitable to densify the metal to have a strength at least substantially that of a conventional wooden tennis racquet frame structure. The frame may be suitably strung to complete the unit.

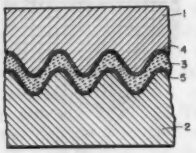


3,605,253
METHOD OF INERTIAL WELDING TO ELIMINATE CENTER DEFECTS
Marion R. Calton, East Peoria, Theodore L. Oberle, Washington, and Carl D. Weiss and Ralph W. Yocum, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed May 13, 1969, Ser. No. 824,066
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **8 Claims**



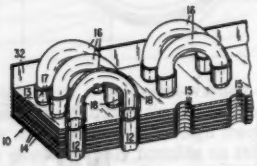
Defects at the center of inertial friction welded parts are prevented from forming during the welding process. The frictional heating is initiated near the center of the interface at the beginning of the welding process. The yielding of the parts is confined to a narrow band of material on either side of the interface throughout the weld process. This insures that the central portions of the end surfaces of the parts being welded are maintained in contact throughout the weld process and are adequately heated to produce the plasticity required to form a weld without defects.

3,605,254
METALLURGICAL BONDING
Marcel Armand, Michel Charveriat, and Jean-Pierre Givord, Albertville, France, assignors to Ugine Kuhlmann, Paris, France
Filed Sept. 6, 1968, Ser. No. 758,064
Int. Cl. B21d *39/04*
U.S. Cl. 29—473.7 9 Claims



A process for providing a metallurgical bond between a special metal piece of Ti, Zr, Hf, U, Nb, Ta or alloys of these metals and a steel piece. A mechanical junction is first prepared providing a slight clearance between both pieces. The surfaces of the pieces facing the junction are treated with a molten flux. Thereafter, the junction is filled with a brazing alloy consisting essentially of Al, Si, Fe and the special metal. After the junction is filled, it is allowed to cool.

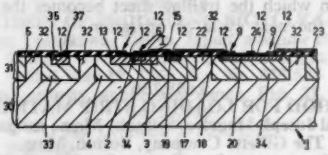
3,605,255
METHOD FOR BRAZING
Benjamin A. Metzger, Shaker Heights, Ohio, and Harry E. Miller, Westmoreland, Pa., assignors to Carrier Corporation, Syracuse, N.Y.
Original application Jan. 19, 1966, Ser. No. 521,681. Divided and this application June 17, 1968, Ser. No. 753,301
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 5 Claims



A method of brazing structural parts which includes the steps of pre-heating the parts to a temperature below the melting point of the brazing alloy and thereafter supplying heating at a temperature in excess of the melting point of the brazing alloy to accomplish unison of the parts.

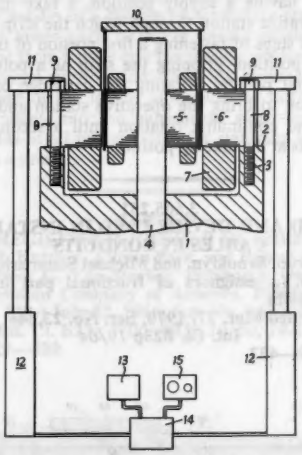
3,605,256
METHOD OF MANUFACTURING A TRANSISTOR AND TRANSISTOR MANUFACTURED BY THIS METHOD
Albert Schmitz, Emmasingel, Eindhoven, Netherlands
Filed Oct. 2, 1968, Ser. No. 764,580
Claims priority, application Netherlands, Oct. 7, 1967, 6713666
Int. Cl. B01j *17/00*; H01l *5/00*
U.S. Cl. 29—578 12 Claims

A method of manufacturing a double-diffused transistor using an integral masking layer by the so-called planar process in which, after the emitter region is formed by diffusion through an emitter window in the masking layer, the earlier provided base window is entirely reopened exposing the emitter base junction at the surface, following



which a second masking layer is provided on the exposed semiconductor surface and windows established therein for providing contacts to the emitter and base regions.

3,605,257
METHOD FOR MOUNTING LAMINATED STATORS
Gilbert Andrew McMahon, Motherwell, Scotland, assignor to Ranco Motors Limited, Glasgow, Scotland
Filed May 13, 1968, Ser. No. 728,428
Claims priority, application Great Britain, May 18, 1967, 23,258/67
Int. Cl. H02k *15/00*
U.S. Cl. 29—596 10 Claims

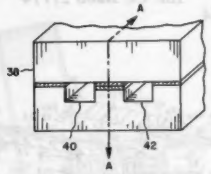


A method of assembly of an electric motor comprising a mounting block, a rotor mounted to rotate relative to the mounting block and a stator secured to the mounting block; the method consisting in applying a purely axial compressive force to the stator as it is secured to the block.

3,605,258
FABRICATION OF RECORDING HEADS
Robert D. Fisher, Woodstock, and George C. Puram, Saugerties, N.Y., and Thomas J. Tidd, Springfield, Del., assignors to Ferroxcube Corporation, Saugerties, N.Y.
Filed Nov. 21, 1968, Ser. No. 777,690
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 10 Claims

A method of assembly and manufacturing micro gap transducing heads with operating gaps for recording or reading in a range from 1 to 150 μinches and bonded with sputter deposited glass and/or metal gap materials with a high material or head yield including the steps of machining a ferrite bar into a plurality of faced segments separated by grooves, R.F. sputtering a non-magnetic material such as glass or metal on the operating gap face and

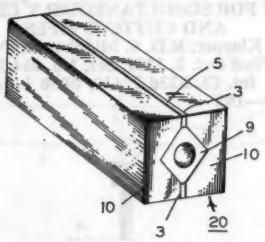
a metal on the back gap face, bonding a second mating bar to the said bar, and cutting and dicing the bonded bars as desired to form individual pole pieces for subsequent assembly into a transducing head. An alternative method sputter etches away non-desired gap face segments until a desired gap depth is reached, then R.F. sputter depositing a dielectric such as glass onto both faces, then bonding, cutting and dicing.



3,605,259
METHOD OF MANUFACTURING A PAIR OF POLE PIECES FOR A MAGNETIC HEAD

Yoshio Tawara and Yasumasa Komatsu, Osaka-fu, and Hozumi Hirota, Nara-ken, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 26, 1969, Ser. No. 802,409
Claims priority, application Japan, Mar. 6, 1968, 43/15,007
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 **2 Claims**



A pair of pole pieces having a magnetic head which have tips of a magnetic alloy with a spacer of non-magnetic metal between the tip end portions of said tips for forming a non-magnetic gap. The pole pieces are formed by grooving the flat surfaces of two magnetic alloy bars, depositing a non-magnetic metal film on the flat top surfaces of the bars and wetting the inside of the grooves with a soldering material. The thus prepared bars are brought together due to the flat surfaces abutting each other and then the soldering material is heated so as to adjoin the abutting bars. The thus joined bars are cut along a plane perpendicular to the abutting surfaces of the bars and then each of the cut surfaces is cut along a plane perpendicular in longitudinal axes of the parts to produce a plurality of pairs of pole pieces.

3,605,260
METHOD OF MAKING MULTILAYER PRINTED CIRCUITS

Jack P. Spridco, New Berlin, Wis., and Thomas A. Mancewicz, Lathrup Village, Mich., assignors to General Motors Corporation, Detroit, Mich.

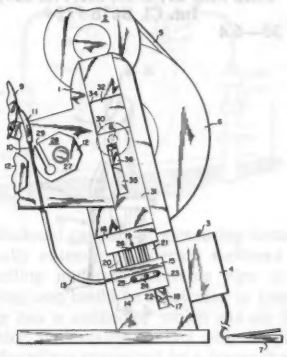
Filed Nov. 12, 1968, Ser. No. 774,705
Int. Cl. H01b *5/14, 17/62;* **H05k** *3/06*
U.S. Cl. 29—625 **2 Claims**

In a method of making printed circuits a thick conductive sheet carried by a substrate is etched to form circuit pathways. The pathways are reduced in thickness by partial etching except certain portions whose thickness is preserved to form interconnections. The etched away portions are filled with insulating material and a second set of conductors are formed thereon connecting with the interconnection points.

3,605,261
METHOD AND APPARATUS FOR MAKING TERMINALS AND FOR ATTACHING THE SAME TO CONDUCTORS

Irwin Zahn, Arthur Graf, and Irving W. Rosenbaum, New York, N.Y., assignors to Genstape, Inc., New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,400
Int. Cl. H01r *43/00, 43/04*
U.S. Cl. 29—628 **12 Claims**



A metal strip is intermittently fed through an aperture forming station to an attaching station. Progressive tools at the forming station punch apertures in the strip to leave connected terminal blanks. At the attaching station, the blanks are sequentially severed from the strip, a portion of each blank is bent into an approximate U-shape, and then forced into a crimping die which clamps the bent blank portion over a conductor introduced into the die.

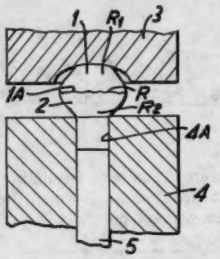
3,605,262
PRODUCTION OF RIVET-TYPE BIMETAL CONTACTS

Akira Shibata, Tokyo, Japan, assignor to Chugai Electric Industrial Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1968, Ser. No. 775,649
Claims priority, application Japan, Aug. 2, 1968, 43/54,693
Int. Cl. H01r *9/16*
U.S. Cl. 29—630C **4 Claims**

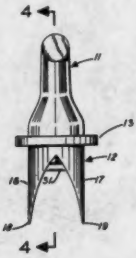
A rivet-type bimetal contact is produced by coaxially superposing a linear piece of a ductile precious contact metal onto the end face of a different ductile metal with its opposite end anchored in a die, the contact faces of the two metals being freshly cut. The contact metal is axially upset by applying impact pressure to deform and flatten the superposed metals at least 20% of their height, and preferably at least 30 or 50%, to bring the cut faces into intimate and crystallographic contact whereby the

interface is increased in area and effect cold bonding of the two faces, and then immediately heating the two metals to an elevated temperature below the melting points



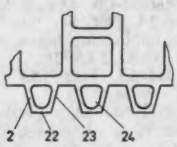
of the metals but above the recrystallization temperaure while under pressure to complete the deformation and form a high strength bond at the bimetal interface.

3,605,263
HOLE CUTTER
William C. Simmonds, 6120 Elder Creek Road, Sacramento, Calif. 95824
Filed May 29, 1969, Ser. No. 829,016
Int. Cl. B67b *7/24*
U.S. Cl. 30—6.4 **2 Claims**



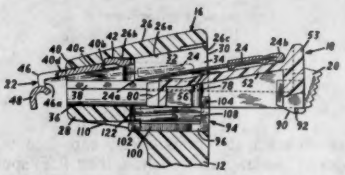
A hand-operated hole cutter with a pair of hardened cutting blades or prongs formed as portions of a surface of revolution and tapering slightly toward each other with gripping means at the rear thereof and a magnet therebetween.

3,605,264
SHAVER WITH A TWIN-FOIL CUTTING HEAD
Bodo Futterer, Schonbuhlring, Switzerland, assignor to The Gillette Company, Boston, Mass.
Filed Sept. 18, 1968, Ser. No. 760,524
Claims priority, application Switzerland, Sept. 18, 1967, 13,057/67
Int. Cl. B26b *19/06, 19/10, 19/38*
U.S. Cl. 30—34.1 **3 Claims**



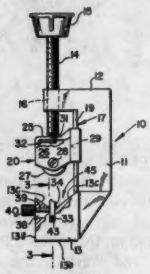
A two foil shaving head for dry shavers, the inner foil having projecting teeth for cutting long hairs. The projecting teeth form an acute angle with their corresponding cutting openings and have recesses therein for better abutment of the cutting teeth against the curved outer foil.

3,605,265
RAZOR HAVING MOVABLE BLADE-CARRYING DRAWER
Clemens A. Iten, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Mar. 18, 1969, Ser. No. 808,057
Int. Cl. B26b *21/14*
U.S. Cl. 30—64 **12 Claims**



A safety razor assembly in which a blade-carrying drawer is slidably mounted in the razor head and is movable forwardly into a latch shaving position with associated guard means, and upon release of the latch means a spring is effective to move the drawer to a retracted position wherein a used blade may be readily replaced, the drawer having therein a spring means for urging the blade forwardly against blade stop means in appropriate shaving position adjacent the guard when the drawer is in its forward position.

3,605,266
DEVICE FOR SIMULTANEOUSLY CLEANING AND CUTTING PIPES
Martin A. Klapper, R.D. 6, Middletown, N.Y. 10940
Filed Oct. 2, 1969, Ser. No. 864,950
Int. Cl. B23d *21/10;* **B08b** *1/04*
U.S. Cl. 30—102 **2 Claims**

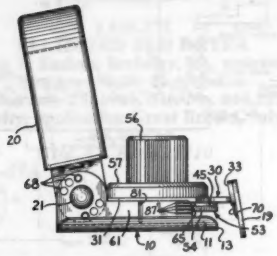


A tool for cutting a pipe and simultaneously cleaning the outer surface of the pipe about the cut comprising a pipe cutter combined with a scraping or abrasive member lying in a plane at right angles to a cutter wheel of the pipe cutter.

3,605,267
CARPET TRIMMING TOOL
Roy L. Brenner, Highland Park, Ill., assignor to Kinkead Industries Incorporated, Chicago, Ill.
Filed Mar. 21, 1969, Ser. No. 809,238
Int. Cl. B26b *29/00*
U.S. Cl. 30—287 **8 Claims**

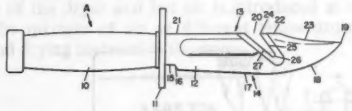
A tool for trimming carpet to fit against a wall or baseboard having a base plate for riding along the carpet and an assembly which includes a blade holder plate and reference plate mounted on a threaded post and having

clamping nuts for clamping the assembly in a position of vertical adjustment to provide the desired cutting height. The blade holder plate has a relative horizontal adjustment to establish the width of an entry slot for confining



carpet of different thickness as it is being cut. Improved means are provided for preventing relative rotational and in and out movement of the plates when clamped in working position.

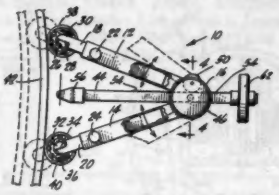
3,605,268
HUNTING KNIFE
Clyde R. Cassell, Sr., 205 Lionville Road, Downington, Pa. 19335
Filed Oct. 25, 1968, Ser. No. 770,536
Int. Cl. B26b *29/02*
U.S. Cl. 30—294 **1 Claim**



This specification discloses a knife intended primarily for use in the hunting of game and which comprises a handle, a hilt and a blade. The latter element is of steel and is defined by two edges, an inner edge and an outer edge, and which edges meet at a point. The inner edge includes a straight portion adjacent to the hilt and is formed with a notch that extends into the blade in the direction of the point. This notch leaves a straight heel portion extending to the hilt. The notch has a blunt point, a sharp under edge, a sharp round corner and an upper edge which is blunt.

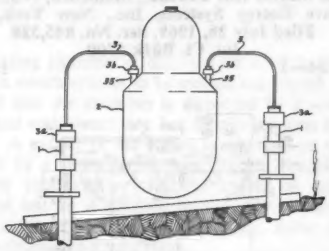
3,605,269
DRAFTING AID
James C. Driskill, Long Beach, Calif. (16291 Hawaii Lane, Huntington Beach, Calif. 92649)
Filed Apr. 24, 1969, Ser. No. 819,002
Int. Cl. B43l *13/02*
U.S. Cl. 33—42 **4 Claims**

A drafting aid to assist in the drawing of parallel contours from a model contour comprising two leg elements depending from a central hub and adjustable with respect thereto, each leg element being individually longitudinally adjustable, each leg element terminating in a low-frictional device adapted to abut the model contour, each low-frictional device being adjustable with respect to the model contour, a third low-frictional device adjacent the hub to prevent dragging of the hub upon the working surface, a longitudinally adjustable shaft extending between the leg elements, the shaft being capable



of being fixed in one position and to permit deployment of a drawing instrument to contact the working surface.

3,605,270
ART OF MEASURING DISTANCES BETWEEN TWO UNDERSEA POINTS REMOTELY
Walter Brown, Long Beach, Calif., assignor to North American Rockwell Corporation
Filed Jan. 2, 1970, Ser. No. 339
Int. Cl. G01b *3/20, 5/14;* **G01d** *7/04*
U.S. Cl. 33—174 **8 Claims**

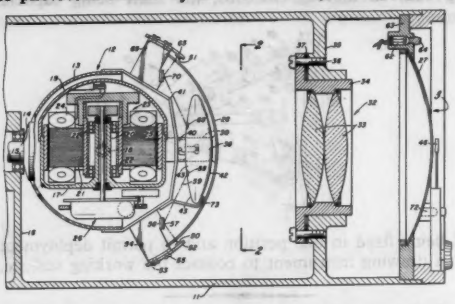


A gauge is disclosed capable of measuring distances between a vertically extending undersea wellhead and an upwardly extending undersea receiving pipe so that a connecting tubing loop could be fabricated to connect the two. The gauge has a connector which sits on the wellhead, and a feeler, for making contact with the pipe. The connector and feeler are connected by a frame that allows the feeler to move in two orthogonal directions relative to the connector. The gauge is lowered to the sea floor so that guide sleeves fixed to the connector engage vertical guide pins around the wellhead and so that guide sleeves fixed to the feeler engage other guide pins around the pipe. The connector engages the wellhead first and then an electric motor lowers the frame and feeler. When the feeler contacts the pipe, the motor is stopped and locked in place, providing an indication of the spacing in the vertical direction. A marker is provided to mark the frame with respect to the feeler to indicate the spacing between the connector and feeler in the horizontal direction and the angular deviation between center-lines of wellhead guide pins and the guide pins associated with the receiving pipe.

3,605,271
ATTITUDE INDICATING INSTRUMENT
Edgar R. Brastow, Monrovia, Raymond A. Stoer, Thousand Oaks, and John M. Leitch, Alhambra, Calif., assignors to Clary Corporation, San Gabriel, Calif.
Filed Dec. 9, 1968, Ser. No. 782,208
Int. Cl. G01c *15/14;* **G01d** *5/32, 5/34*
U.S. Cl. 33—204 **9 Claims**

An artificial horizon instrument having a freely mounted vertical axis gyroscope, a mask carried by the gyroscope rotor housing and a light source carried by a gimbal supporting the rotor housing. One edge of the mask forms a horizon line which is optically projected

onto a translucent reference screen. Light beams directed to photocells carried by another of the gyroscope gimbals



are normally cut off by the mask but are uncovered when the aircraft assumes an abnormal "nose high" or "nose low" attitude whereby to energize respective alarm devices.

3,605,272

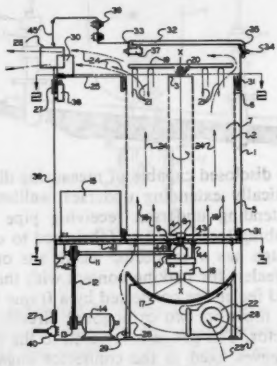
METHOD AND APPARATUS FOR DRYING AND STERILIZING FABRICS AND THE LIKE

Raymond Marcel Gut Boucher, Metuchen, N.J., assignor to Wave Energy Systems, Inc., New York, N.Y.

Filed July 28, 1969, Ser. No. 845,329

Int. Cl. B01k *5/00*

U.S. Cl. 34—1 **16 Claims**



A method for rapid drying and sterilizing of clothes, fabrics, garments, textiles and the like in which electromagnetic waves (100 to 300,000 MHz.) are combined with a fast moving air stream while the irradiated material rotates slowly in the processing area in a direction transverse to the air stream and the propagated electromagnetic waves. The apparatus of the invention is the size of a conventional home dryer, is noiseless and can dry a 7-pound fabric workload in two to five minutes while destroying all household germs or microbiological contaminants. It is equipped for automatic operation for different kinds of fabrics and health hazards have been eliminated through the use of automatic safety devices.

3,605,273

CONTINUOUS PROCESS AND APPARATUS FOR DRYING TITANIUM SPONGE

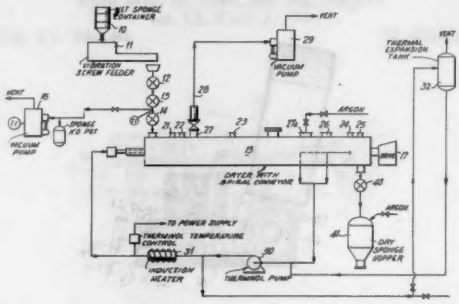
Thor W. Andersen, Ashtabula, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of application Ser. No. 704,801, Feb. 12, 1968. This application Jan. 16, 1970, Ser. No. 4,465

Int. Cl. F26b *5/04*

U.S. Cl. 34—15 **9 Claims**

A continuous process for drying titanium sponge in which wet sponge is continuously conveyed to an evacuated drying chamber. A continuous conveyor in the drying chamber transports the wet sponge through a heated zone toward a discharge end. Vaporized moisture from



the sponge is condensed in the vacuum pump which is a liquid jet pump which acts as a highly efficient condensor. The dried sponge is then continuously moved into storage hoppers.

3,605,274

MULTISTAGE FLUIDIZATION POWDER DRYING PLANT USING FLUIDIZING GASES HAVING DIFFERENT DEW POINTS

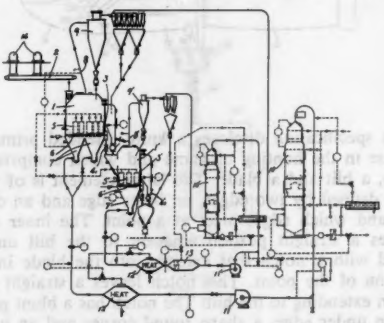
Jiyuichi Nara, 2–7–8 Higashi-ooi, Shinagawa-ku, Tokyo, Japan

Filed July 7, 1969, Ser. No. 839,249

Claims priority, application Japan, July 13, 1968, 43/49,537

Int. Cl. F26b *17/00*

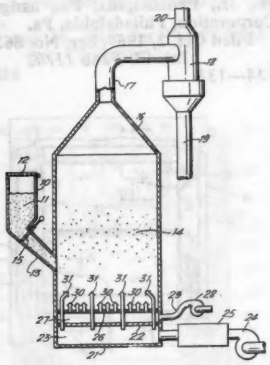
U.S. Cl. 34—57A **3 Claims**



A multistage plant for fluidizing and drying powder by use of gas cooled at different dew points, said plant comprising a first stage flow system and a second stage flow system connected thereto, and if necessary, a third and more stages connected in succession by a similar connection system, said first stage flow system including a first stage gas circulating passageway to which are connected a cyclone collector adapted to purify fine powder mixed with exhaust gas of a first stage fluidization powder drying column and collect the fine powder, a means for purifying, cooling and drying said exhaust gas, and a means for heating said gas and forcedly feeding the gas to heated gas regulating chambers provided on the underside of a porous plate of said first stage fluidization powder drying column, said second stage flow system including a second gas circulating passageway in which a dried powder inlet

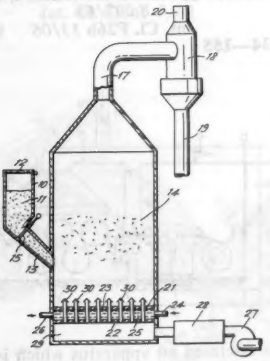
of said second fluidization powder drying column is connected to a dried powder outlet of the first stage fluidization powder drying column of said first stage flow system and a gas drying means are disposed in said first stage gas circulating passageway.

3,605,275
FLUIDIZED BED DRYER
Joseph T. Enders, Berkeley, Ill., assignor to Struthers Wells Corporation
Filed July 24, 1969, Ser. No. 844,257
Claims priority, application Great Britain, July 29, 1968, 35,994/68
Int. Cl. F26b *17/10*
U.S. Cl. 34—57A 2 Claims



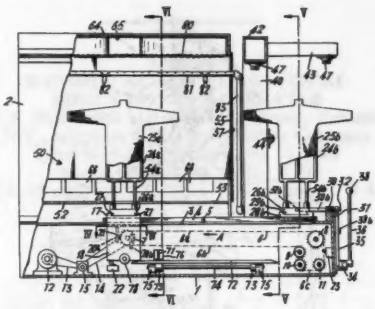
In a fluidized bed dryer, cold air is introduced into the bottom of the dryer and hot air is introduced at a higher level, the mixture of air at different temperatures fluidizing and drying material in the dryer.

3,605,276
FLUIDIZED BED DRYER
Joseph T. Enders, Berkeley, Ill., assignor to Struthers Wells Corporation
Filed July 25, 1969, Ser. No. 844,940
Claims priority, application Great Britain, July 29, 1968, 35,995/68
Int. Cl. F26b *17/10*
U.S. Cl. 34—57A 2 Claims



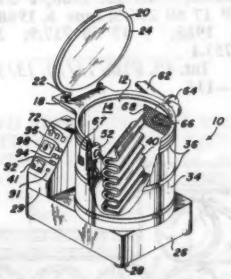
In a fluidized bed dryer hot air is introduced into the bottom of the dryer through nozzles fixed in a cooled distributor plate.

3,605,277
APPARATUS FOR FINISHING KNITTED GOODS
Heiji Kakutani, Osaka, Japan, assignor to Kakutani Seisakusho Ltd., Osaka, Japan
Filed Aug. 5, 1969, Ser. No. 847,605
Int. Cl. F26b *21/06*
U.S. Cl. 34—83 4 Claims



A treating chamber is disposed on a track for guiding forms on which articles to be treated are placed. Hot blast supplied into the chamber is dispersed by a wire netting and mixed with steam into hot humid gas near the ceiling portion. A carrier of the forms is sent into or out of the chamber by a chain driven in a definite direction and in operative relationship with the travel of carrier, the supply of hot air is effected, so that the articles are subjected to the hot humid air uniformly. After treatment, they are dried with a cold blast.

3,605,278
VACUUM DRYING APPARATUS
James M. Ramsay, Yuma, Ariz., assignor to the United States of America as represented by the Secretary of the Navy
Filed Sept. 25, 1969, Ser. No. 861,104
Int. Cl. F26b *13/30*
U.S. Cl. 34—92 2 Claims

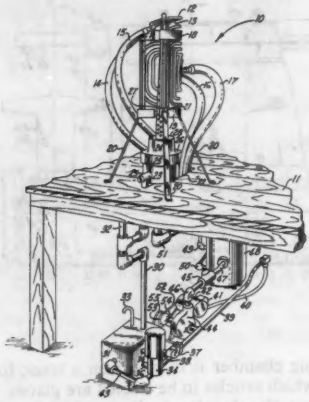


Vacuum drying apparatus having a stationary, hermetically sealable chamber to receive the article to be dried, the chamber being heated to a predetermined temperature the article can tolerate, the chamber also being subjected to a vacuum to reduce the boiling point of the moisture in the article below the predetermined temperature to boil-off of the moisture which is vented from the chamber.

3,605,279
APPARATUS FOR DEGREASING A ROCKET MOTOR CASE

William D. Fiser, Huntsville, Ala., and Allan E. Williams, Kingsland, Ga., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Aug. 1, 1969, Ser. No. 846,745
Int. Cl. B08b 9/12
U.S. Cl. 34—104 9 Claims

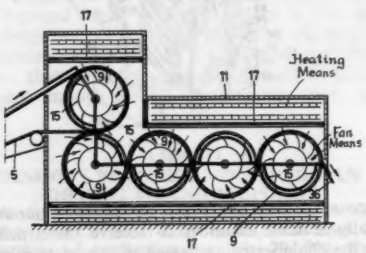


An apparatus that utilizes a vaporized solvent for degreasing a rocket motor case and having water cooling coils incorporated therein to chill the rocket motor case and thereby condense the vapor after it enters the rocket motor case so that the condensate will contact and flow down the interior wall surface of the rocket motor case to remove any contaminants therefrom.

3,605,280
COMBINATION DRYING AND TENTERING MACHINE

Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland

Continuation-in-part of application Ser. No. 654,728, July 20, 1967. This application Feb. 14, 1969, Ser. No. 799,478
Claims priority, application Germany, Mar. 6, 1968, P 17 10 514.5; Mar. 13, 1968, P 17 10 515.6; Apr. 19, 1968, P 17 60 226.5; June 6, 1968, P 17 60 574.2; June 22, 1968, P 17 60 717.9; June 27, 1968, P 17 60 751.1
Int. Cl. F26b 13/10, 13/30
U.S. Cl. 34—115 1 Claim

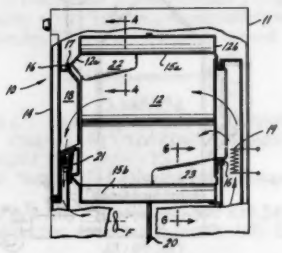


The present disclosure is directed to a process and apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, and outlet means for removing the material being treated from the treatment chamber.

3,605,281
CLOTHES DRYER

James R. Hubbard, Moorestown, N.J., and Elmer W. Zearfoss, Jr., Philadelphia, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Oct. 2, 1969, Ser. No. 863,195
Int. Cl. F26b 11/02
U.S. Cl. 34—133 3 Claims

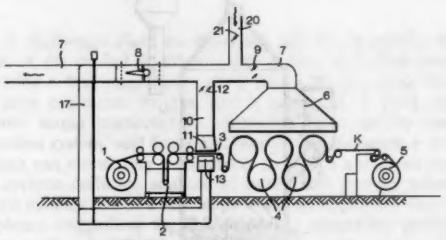


A clothes dryer having a drum provided with a plurality of clothes tumbling baffles extending parallel to the axis of the drum and substantially throughout the full length thereof. At least an opposed pair of baffles are provided with fins projecting from the baffle radially toward the axis of the drum and extending axially throughout substantially less than the length of the drum. The fin and baffle combination provides a desired tumbling effect.

3,605,282
APPARATUS FOR DRYING FABRIC

Max Wenger, Niederuzwil, Switzerland, assignor to Maschinenfabrik Benninger AG, Uzwil, Switzerland

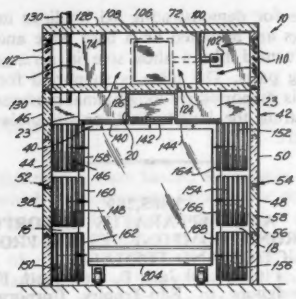
Filed June 3, 1969, Ser. No. 830,033
Claims priority, application Switzerland, June 10, 1968, 8,607/68
Int. Cl. F26b 13/06
U.S. Cl. 34—155 5 Claims



There is disclosed an apparatus which is adapted to be arranged in front of a contact cylinder dryer for predrying, by means of hot air, fabric warp continuously fed to the contact cylinder dryer. The inventive apparatus incorporates outlet slot means for a current of hot air,

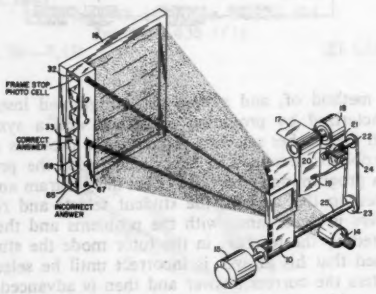
such outlet slot means extending throughout the entire width of the yarn field and being directed approximately perpendicular towards such yarn field. A suction slot means is situated at the opposite side of the yarn field in the extension of the outlet slot means. This suction slot means extends throughout the entire width of the yarn field and is directed approximately perpendicular thereto. Further, means are provided for producing an air current from the outlet slot means to the suction slot means such that the quantity of air sucked per unit of time through the suction slot means is at least equal to the quantity of air discharged per unit of time from the outlet slot means.

3,605,283
SHRINK TUNNEL
Seymour Zelnick, Orange, N.J., and Kelvin G. Anderson, Bronx, N.Y., assignors to Weldotron Corporation, Newark, N.J.
Filed Apr. 10, 1969, Ser. No. 814,934
Int. Cl. B65b *53/00*
U.S. Cl. 34—224 **18 Claims**



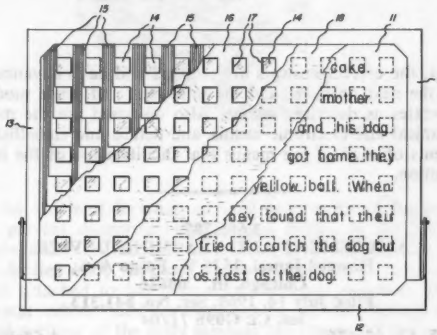
New and improved shrink tunnel comprising hot gas generating means for the shrink wrapping of thermoplastic load wrap materials is provided, and includes shrink tunnel support means which function to both support the said shrink tunnel and provide means for directing said hot gases generally tangentially of said thermoplastic load wrap materials to shrink-wrap the same.

3,605,284
EDUCATIONAL DEVICE
Andrew F. Kay, 340 Serpentine Drive, Del Mar, Calif. 92014
Filed Feb. 10, 1969, Ser. No. 806,337
Int. Cl. G09b *7/02*
U.S. Cl. 35—9 **6 Claims**



My invention comprises essentially an audio-visual educational device including optical means for displaying a series of questions and answers in alternating frames and an auditory system synchronized with and explaining the visual answers; the advancement of the successive frames being dependent upon the selection of a true or false answer, wherein a selection of a true answer advances the visual portion forward to the next question and the selection of a false answer advances said visual portion to the correct answer and causes the actuation of the auditory means.

3,605,285
RANDOM ACCESS AUDIO-VISUAL EDUCATIONAL APPARATUS
David J. BenDaniel and James B. Comly, Schenectady, N.Y., assignors to General Electric Company
Filed May 26, 1969, Ser. No. 827,608
Int. Cl. G09b *5/04*; G11b *17/00*
U.S. Cl. 35—8A **9 Claims**

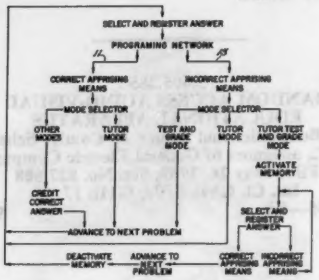


A system for providing an audio explanation as a supplement for any desired information printed on a sheet of paper comprises an array of flexible contacts over which the sheet is positioned. By depressing the sheet at the location of the information for which additional explanation is desired, a phonograph pickup is moved into a predetermined one of a plurality of grooves recorded in the form of nested spirals on a phonograph disk in order to reproduce audibly the corresponding information recorded thereon.

3,605,286
METHOD AND APPARATUS FOR PROGRAMED INSTRUCTION AND TESTING
George W. Plumly, Fort Worth, Tex., assignor to Edu-Tronics Corporation, Fort Worth, Tex.
Filed May 8, 1969, Ser. No. 823,044
Int. Cl. G09b *7/08*
U.S. Cl. 35—9R **28 Claims**

A method of, and system for, programed instruction characterized by providing a method of simultaneously teaching, testing and grading a student in which the student's first answer to a problem is scored as a correct answer and in which the student must ultimately select a correct answer before he can proceed to the next problem, although a later correct answer will not be given credit. In another aspect, a method and a system are afforded wherein the teacher selects a program and provides a series of problems arranged in accordance with the program; sets a programing network to effect the program and gives the test to the student; the student selects

and registers answers in accordance with the problems and the mode selected by the teacher; in the tutor mode, the student is advised that his answer is incorrect until he selects and registers the correct answer and then is advanced to the next problem; in the test and grade mode, the student is advised that his answer is correct or incorrect, the correct answers are counted and he is advanced to the next problem; and the tutor, test and grade mode operates as described above. Also disclosed are the mechanical and electronic means, and details and embellishments of each of the means that facilitate use of the invention.

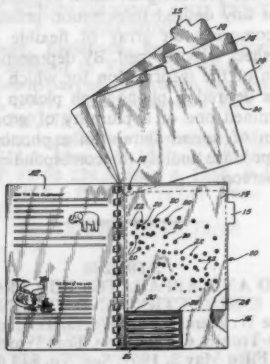


3,605,287

AMUSEMENT AND TEACHING DEVICE

Howard Jonesi, 1526 W. Fargo Ave., Chicago, Ill. 60626

Filed July 14, 1969, Ser. No. 841,313
Int. Cl. G09b *11/04*
U.S. Cl. 35—26 **4 Claims**



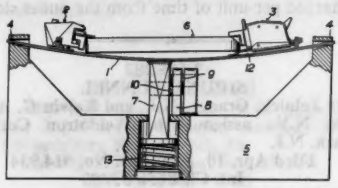
An amusement and teaching device for use in forming the outline of a character or figure comprising, a guide member provided with a first plurality of small openings arranged to form the outline of a first figure or character, a second plurality of small openings arranged to form the outline of a second character or figure, with the first and second plurality of openings each having different identifying means, and a marking surface adapted to be positioned under the guide member so that a series of dots forming the outline of the figure or character can be impressed on the marking surface through the plurality of openings on the guide member.

3,605,288

DEVICE FOR DEMONSTRATING SKI BINDINGS

Thomas G. Smolka, Vienna-Mauer, Austria, assignor to Wiener Metallwarenfabrik Smolka & Company, Vienna-Mauer, Austria

Filed June 27, 1969, Ser. No. 837,122
Claims priority, application Austria, July 1, 1968, A 6,318/68
Int. Cl. G09b *25/00*
U.S. Cl. 35—49 **6 Claims**



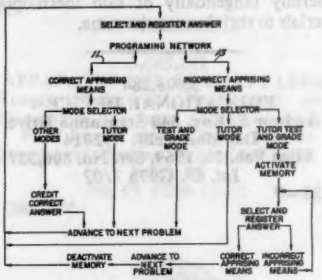
A device for demonstrating ski bindings in which the ski bindings are mounted on a base plate and a shoe or a model formed like a shoe sole in arranged between the binding parts. The plate is supported for flexing or the model is supported for longitudinal movement in order to demonstrate the longitudinal, or slide, elasticity of a binding part.

3,605,289

METHOD AND APPARATUS INCORPORATING ELECTRONIC COMPONENTS FOR PROGRAMED INSTRUCTION AND TESTING

George W. Plumly and Jack B. Hunnicutt, Fort Worth, Tex., assignors to Edu-Tronics Corporation, Fort Worth, Tex.

Filed May 8, 1969, Ser. No. 823,124
Int. Cl. G09b *7/08*
U.S. Cl. 35—9R **42 Claims**



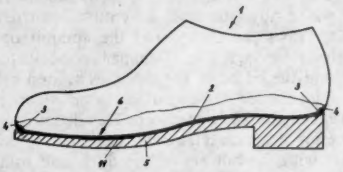
A method of, and system for, programed instruction characterized by providing a method and a system in which the teacher selects a program and provides a series of problems arranged in accordance with the program; sets a programing network to effect the program and gives the test to the student; the student selects and registers answers in accordance with the problems and the mode selected by the teacher; in the tutor mode the student is advised that his answer is incorrect until he selects and registers the correct answer and then is advanced to the next problem; in the test and grade mode, the student is advised that his answer is correct or incorrect, the correct answers are counted and he is advanced to the next

problem; and in the tutor, test and grade mode, the student is advised that each answer is correct or incorrect, his first answer to a problem is scored as a correct answer if it is correct and the student is required to utimately select a correct answer before he can proceed to the next problem, although a later correct answer will not be given credit. Also disclosed are the mechanical and electronic means, and details and embellishments of each of the means that facilitate use of the invention.

3,605,290
SHOE AND METHOD OF MANUFACTURING SAME

Otto Eder, Ternitz, and Wladimir Hascic, Maria Enzersdorf, Austria, assignors to Semperit Osterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Vienna, Austria

Filed July 7, 1969, Ser. No. 839,728
Claims priority, application Austria, July 5, 1968, A 6,475/68
Int. Cl. A43b *9/16*
U.S. Cl. 36—2.5 **8 Claims**

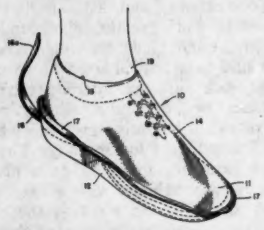


There is disclosed a shoe having an outsole of elastic material in which the connection between the outsole and the insole is interrupted at least in that area of the insole that underlies the ball portion of a wearer's foot. The interruption of the connection can be accomplished by applying a coating to the surface of the insole that is to be adjacent the outsole material, by applying a foil such as polyethylene or polypropylene to such insole surface, by applying silicone coated paper to such insole surface or by cutting out such area of such insole to leave an opening that is filled with elastic outsole forming material. There is further disclosed a method of making such a shoe in which an upper joined to an insole provided with an outsole connection interrupting means such as a cut out is pulled over a last, a mold cavity is closed by the last and outsole forming material introduced into such cavity to mold an outsole and bond same to said formed upper and insole except at the area provided with said connection interrupting means.

3,605,291
DISPOSABLE FOOT COVERING

Francis C. Moore and Leon R. Perkinson, Indianapolis, Ind., assignors to Moore-Perk Corporation, Indianapolis, Ind.

Filed July 27, 1970, Ser. No. 58,404
Int. Cl. A43b *3/16*
U.S. Cl. 36—7.1R **21 Claims**

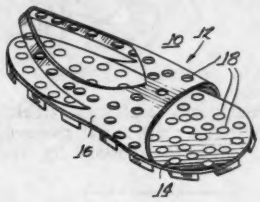


A disposable foot covering comprising a pair of superimposed layers of film or sheet material marginally sealed together, the upper of such layers being formed of a high elongation elastomer film and being provided with a small but greatly expandable opening for the insertion of a wearer's foot. A fused marginal bead about the opening prevents tearing as the material about the opening is stretched. Breathability of the cover, where necessary, is insured by forming the cover's lower layer from a porous moisture-resistant film or sheet.

3,605,292
SAFETY FOOTWEAR

Lillian Goldblatt, 715 Ridge Road, Wilmette, Ill. 60091

Filed May 18, 1970, Ser. No. 38,389
Int. Cl. A43b *5/08*
U.S. Cl. 36—8.1 **8 Claims**

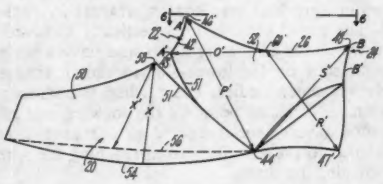


An article of footwear adapted to be worn on the feet to prevent dangerous slipping and falling in the bath, shower or on other wet surfaces. The article includes a perforated body member, and a sponge rubber layer or sole attached to the bottom of the body member. The sponge rubber sole has openings or cut-out sections so that portions of the body member are exposed. The body member is provided with means to hold it on the wearer's foot.

3,605,293
SOFT BOOT CONSTRUCTION

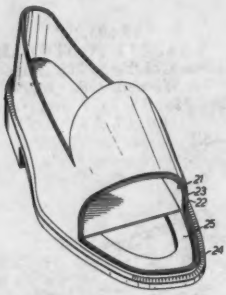
Douglas E. Getchell, Windsor Locks, Conn., John J. Korabowski, Springfield, Mass., and Michael A. Marroni, Jr., Weatogue, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 20, 1968, Ser. No. 785,616
Int. Cl. A43b *1/02*
U.S. Cl. 36—9 **10 Claims**



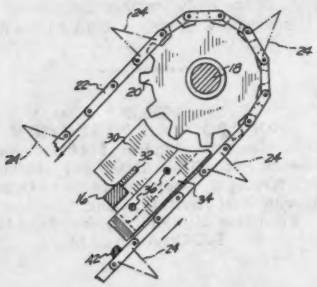
In a pressurized suit having a convoluted ankle joint and a fabric boot, the angle joint and boot are constructed to provide a comfortable and efficient ankle joint. The pattern for the boot has a particular geometry utilizing the pressure forces created within the boot fabric in such a way as to provide a vertical wall of sufficient rigidity, at least in the instep and heel areas, to avoid any pressure points at these locations.

3,605,294
SHAPED ARTICLES
Victor Ralph Cunningham, Hutton, and Graham Rodney Hull, Dagenham Dock, England, assignors to Porvair Limited, Dagenham Dock, Essex, England
Filed May 1, 1969, Ser. No. 820,850
Claims priority, application Great Britain, May 1, 1968, 20,737/68
Int. Cl. A43b *00/00, 21/00*
U.S. Cl. 36—45 **7 Claims**



A three dimensionally conformed article comprising sheet polymer material which is water vapour permeable, self-supporting, flexible and substantially resistant to loss of shape.

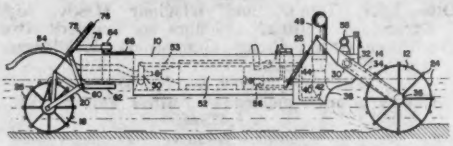
3,605,295
STONE GUARD FOR ELEVATOR SCRAPERS
Roman Joseph Walewski, 32631 Alvin St., Garden City, Mich. 48135
Filed July 7, 1969, Ser. No. 839,200
Int. Cl. B60p *1/36*
U.S. Cl. 37—8 **2 Claims**



A guard for preventing damage to the endless chains and driving sprockets on elevator scrapers by rocks and stones. The guard consists of a vertically disposed plate aligned with each of the sprockets and having a replaceable wear shoe on the lower side in sliding engagement with its associated endless chain when the scraper is in operation. A deflector point on the forward end of each wear shoe diverts rocks and stones from the endless chains so as to prevent them from reaching the sprockets and damaging the chains.

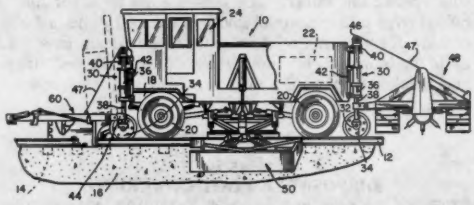
3,605,296
AMPHIBIOUS DITCH EXCAVATOR
Ronald R. Dysart, Oakland, Calif., assignor to Wetland Engineering Co., Oakland, Calif.
Filed Sept. 20, 1968, Ser. No. 761,271
Int. Cl. E02f *3/88, 5/08*
U.S. Cl. 37—61 **2 Claims**

An amphibious vehicle for cutting material from the bottom of a water-filled ditch by means of a revolving cylindrical drum which is studded with projecting cutting elements. The drum, which is journalled to the front of a watertight body member, can be lowered into contact with the bottom of a water-filled ditch when the body member is floating in the ditch. The slurry produced by the rotary cutting action of the drum is drawn into an opening in the bottom of the body member by suction and is pumped out a T-shaped conduit which extends transversely beyond both sides of the body member. The suction at the bottom of the conduit is produced by a jet-pump system in which a stream of water is pumped into the conduit through a jet nozzle near



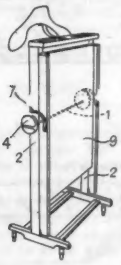
the opening in the bottom of the body member. This stream of water flows through a venturi constriction in the conduit, draws the slurry into the conduit opening, and propels it through the T-shaped conduit for discharge beyond the edges of the ditch. A second cylindrical drum is journalled to supporting arms which project from the rear of the body member. This drum is studded with projecting traction elements and can be lowered into contact with the bottom of the ditch and rotated to propel the body member along the ditch. The rear drum can also be turned from side to side for steering purposes, and the entire vehicle can be driven over land, marsh, or paved roads to reach its destination.

3,605,297
RAILROAD BALLAST PLOW
John Knox Kershaw, Southport, Ind., assignor to The Marmon Group, Inc., Chicago, Ill.
Filed Aug. 5, 1968, Ser. No. 750,101
Int. Cl. E01b *27/00*
U.S. Cl. 37—105 **10 Claims**



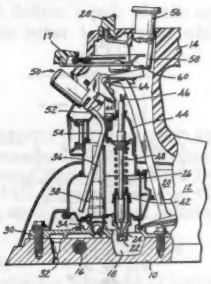
A railway ballast plow has a pair of divided plow or moldboard blades mounted on a frame carried at one end of a vehicle. Remote controls on the vehicle adjust the frame vertically and for steering, shift the blades between work positions, and actuate locking dogs to lock the blades in work positions independently of the shift mechanism. Each blade has lateral halves hinged to each other and to a central fixed hinge pin. The two half blades at each side are interconnected for simultaneous movement by a hydraulic swing cylinder, between forward and rearward operating positions where they are locked to the frame by the locking dogs. The plow frame is tiltably and swingably mounted on a lift carriage at one end of a railway vehicle, with a fixed pivot at one side and with an adjustable pivot at the opposite side which is movable longitudinally to swing the frame about the fixed pivot and hence to position the plow to follow a curved track.

3,605,298
ROOM-VALET PRESS
Giovanbattista Zigliani, Via Galilei 119, Brescia, Italy
Filed Aug. 11, 1970, Ser. No. 62,890
Claims priority, application Italy, Aug. 12, 1969, 2,798/69; Oct. 18, 1969, 2,814/69
Int. Cl. A47j *51/00*
U.S. Cl. 38—71 4 Claims



A device for controlling the displacement of the movable board of a room-valet trouser press, characterized by having a pair of arcuated elastic members pivotably connected to a pair of rotatable knobs, so that when the movable board is successively displaced toward and away from its mating fixed board of the press a perfect alignment of the boards with respect to each other and a perfect hold or pressing action on the article inserted between the two boards is at all times obtained.

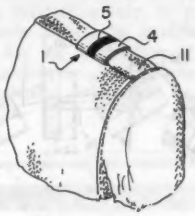
3,605,299
ADJUSTABLE SPRAYER IRON
Harold S. Foster, Ontario, and Wendell C. Walker, Alta Loma, Calif., assignors to General Electric Company
Filed May 14, 1969, Ser. No. 824,591
Int. Cl. D06f *75/06, 75/22*
U.S. Cl. 38—77.83 20 Claims



The disclosure shows a spray iron having an adjustable sprayer assembly with means to vary the liquid flow rate through a sprayer when the button that actuates the sprayer is manually operated.

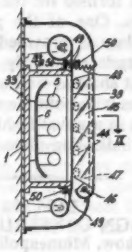
3,605,300
EPAULET BADGE
Leo M. Moore, 8549 Richmond Highway, Apt. 203, Alexandria, Va. 22309
Filed Jan. 14, 1969, Ser. No. 791,080
Int. Cl. A44c *3/100*
U.S. Cl. 40—1.5 7 Claims

An epaulet badge to be worn on the shoulder epaulet of a uniform such as a military uniform is disclosed. The badge is made of one piece of formable ridged material and can readily be attached to or detached from the epaulet. A design or insignia can be printed on, attached to or



painted on the badge. The badge can be made of any color, and the badge can be made to have a glossy finish, a mat finish or a fabric finish.

3,605,301
LIGHTING DEVICE
Michel J. Jacquot, Beynes, and Charles G. Amicel, Carrieres-sur-Seine, France, assignors to Bertin et Cie, Plaisir, Yvelines, France
Filed Nov. 5, 1968, Ser. No. 773,388
Claims priority, application France, Nov. 6, 1967, 127,040; Oct. 4, 1968, 168,773
Int. Cl. G09f *11/12*
U.S. Cl. 40—31 1 Claim

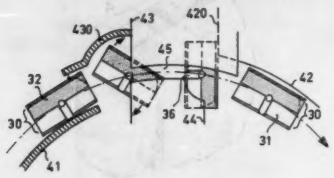


The invention comprehends a lighting device having a light source means, one or more light transmitting layers in front of the light source means which is positioned to transmit light through a zone of the layer or layers, and means for continuously changing the zone of the layer or the zone of the last such layer through which the rays of light, transmitted by the light source means, pass before emerging from the lgihting device by which the light rays always pass through a clean zone of the layer of the last such layer. That layer may be endless and associated with a cleaning means operable to remove dirt from the layer between the time when it leaves the effective light transmitting field of the lighting device and the time when it returns to that field. Alternatively, the layer may comprise a film which passes in front of an illumination window and which is replaced by another film after use.

3,605,302
TRAVELING PLACARD CHARACTER DISPLAY APPARATUS
Werner Müller, Aarau, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed Aug. 14, 1969, Ser. No. 850,170
Claims priority, application Switzerland, Aug. 19, 1968, 12,475/68
Int. Cl. G09f *11/28*
U.S. Cl. 40—32 12 Claims

A novel traveling placard character display apparatus is disclosed, the apparatus being of the type wherein a

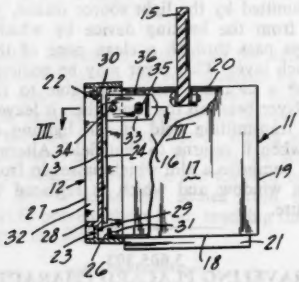
plurality of adjacent columns of dual-faced indicating plates rotatably disposed about respective support shafts are movable over and behind an indicating surface which



provides an environment optically contrasting with both faces of the indicating plates. The two faces of each indicating plate are themselves optically contrasting and a predetermined character can be displayed on the indicating surface depending upon which face of the indicating plates in the plurality of columns are disposed toward the indicating surface. Extinguishing means are provided ensuring that each indicating plate is initially oriented such that a given face or side thereof faces the indicating surface. Read-in means then serve to rotate selective ones of the indicating plates so as to alter their orientation.

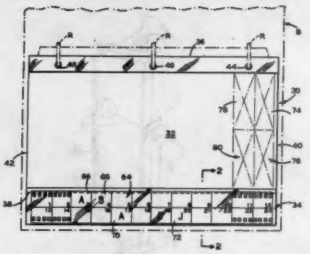
The indicating plates of the instant invention comprise two molded plastic face portions of optically contrasting color which are inserted together in surrounding relationship about collars formed on the support shafts between peripheral grooves. One of the plastic face portions of each indicating plate is provided with a reversing cam means which extends outwardly transverse both to the axis of the support shaft as well as to the visual face portion and cooperates with both the extinguishing means and the read-in means in a novel fashion so as to aid rotation of the associated indicating plate.

3,605,303
SIGN CONSTRUCTION
James R. Reichow, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Jan. 27, 1969, Ser. No. 794,027
Int. Cl. G09f 7/08
U.S. Cl. 40—63R **12 Claims**



A sign includes a casing and a bezel surrounding one side thereof, there being a manually removable message panel disposed between the bezel and the casing, a second message panel projecting from the casing and both message panels being illuminated from a lamp therein, and a pair of pin-and-hole connections between the bezel and the casing.

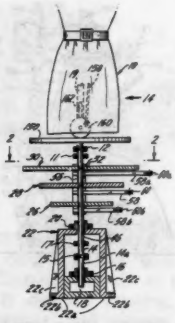
3,605,304
FILM STRIP EQUIPMENT
Marcel Broekman, Kew Gardens, N.Y., assignor to Professional Film Services, Inc., New York, N.Y.
Filed Apr. 3, 1968, Ser. No. 718,563
Int. Cl. G09f 11/06
U.S. Cl. 40—102 **8 Claims**



A combination of a film strip holder and information sheet therefor including a page which is adapted to be received in a loose-leaf binder or the like. A transparent pocket is affixed to one edge of the page and it receives a film strip having a plurality of frames. Respective pieces of data relating to the individual frames are on the page and keying means is provided to correlate each one of the pieces of data to the associated frame.

The invention further includes means for viewing the strip of film.

3,605,305
MANNEQUIN DISPLAY ARRANGEMENT
Raphael G. Grigorian, 90—60 53rd Ave., Elmhurst, N.Y. 11373
Filed Nov. 29, 1968, Ser. No. 779,788
Int. Cl. G09f 19/08
U.S. Cl. 40—106.31 **13 Claims**



A mannequin display arrangement in which a number of mannequins are conveyed along a predetermined path. Each mannequin is mounted upon the conveyor through an individual rotational drive which rotates the mannequin in desired directions and at predetermined intervals along the path. The rotational movement of the mannequin, as well as its limbs with respect to the conveyor system which moves the mannequin along the path, is independent of the motion of the conveyor. A brake system holds the mannequin stationary with respect to the conveyor, when not being rotated through its individual rotational drive.

3,605,306

SELF-MAILING CALENDAR WITH INTEGRALLY FORMED PENCIL HOLDER

Raoul W. Diambra and Lloyd A. Klofanda, Eau Claire, Wis., assignors to Shedd-Brown, Inc., Minneapolis, Minn.

Filed Jan. 21, 1969, Ser. No. 792,441
Int. Cl. G09d *1/00*
U.S. Cl. 40—107 4 Claims

A calendar is shown having an upper panel, a backing panel, a removable panel and a reinforcing panel, with a plurality of calendar pages secured to the backing panel. The calendar has a mailing configuration wherein the upper panel is folded against the backing panel and the removable panel, with the pages between them, and the reinforcing panel is folded over the free edge of the upper panel and adhesively secured to the rear face thereof. The calendar also has a calendar configuration in which the removable panel is removed by means of perforated creases connecting it to the other panels, in which the upper panel and the backing panel lie in the same plane, and in which the reinforcing panel remains adhesively secured to the rear face of the upper panel. The adhesively secured together upper panel and reinforcing panel have a curved slot formed in them to act as a pencil holder. The slot defines a pair of tabs on one side and a single tab on the other side, under which a pencil can be inserted.

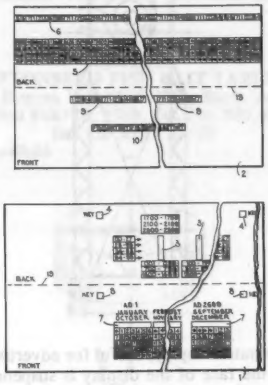
3,605,307

PERPETUAL CALENDARS

Albert Alexander Dickson, 4 Netherleigh Park, Stormont, Belfast, Northern Ireland

Filed Mar. 14, 1969, Ser. No. 807,327
Claims priority, application Great Britain, May 23, 1968, 14,135/68
Int. Cl. G09d *3/04*
U.S. Cl. 40—109 8 Claims

A perpetual calendar is described which may be in the form of a slide rule, for example, in which two members are relatively moveable. One carries indexing positions, one for each day of the week, and the other carries an indicator, arranged in numerical sequence, of the years of a century. The indexing positions are allocated to centuries (according to the Julian and Gregorian centuries) by reference to the week-days on which they terminate, and the spacing between the positions is determined according to unit length multiples, in which a unit length is given a single-day significance and the pitch of the positions is a multiple of seven unit spaces, plus one unit. The year indicator is also spaced out, each common year indication being spaced by one unit from its predecessor in time and each leap year being spaced by two units. Thus the relative movement of the two members to associate a required year with a required century position indicates the terminal week-day of the required year. A calendar on one member with the day allocations omitted may then be completed by the assignment of days from a repetitive "day"-strip on the other member. The terminal day indications may, by predetermined association with code letters, be modified to show the dominical letter for the calculation of Easter Day in respect of the required year. A composite perpetual calendar and Easter calendar device may be formed by providing a further association of index points and indications. Taking into account epact and golden number cycles, the years of a century may be indicated at a regular spacing, and century index positions provided so that the relative movement of the two members to associate a required year with a required century will select a group of seven dates on which Easter Day might fall in the required year, and reference to the dominical letter then enables the particular date for Easter Day to be selected. The epact and golden number for the required year may also be displayed.

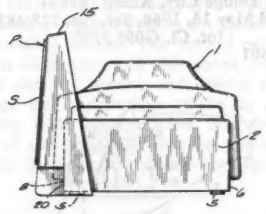


3,605,308

DISPLAY PANEL FOR IMPRINTERS

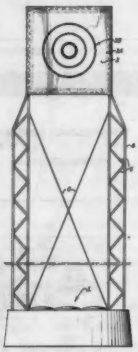
Daniel P. Novak, Parkridge, and David R. Main, Glenview, Ill., assignors to Frank Mayer & Associates, Grafton, Wis.

Filed Nov. 12, 1969, Ser. No. 875,922
Int. Cl. G09f *7/18*
U.S. Cl. 40—125 2 Claims



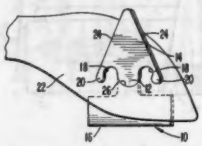
A display panel for association with an imprinter and which panel has engaging surfaces that insure proper abutment with the imprinter. The panel also includes an adhesive strip for being readily held by the imprinter, the weight of the imprinter acting to hold the panel firmly in place.

3,605,309
ILLUMINATED DISPLAY HAVING REMOTE LIGHT SOURCE
Gerald A. Beaty, Norristown, Pa., and Frederick L. Lynch, Andover, Mass., assignors to Elinore J. Beaty, Meadwood, Del., and American Cyanamid Company, Stamford, Conn.
Filed Sept. 19, 1966, Ser. No. 580,250
Int. Cl. G09f *13/00*
U.S. Cl. 40—130B 5 Claims



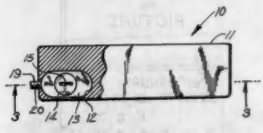
In an illuminated display, useful for advertising and as a work of art, the face of the display is suspended above a remote source of substantially parallel light rays and comprises at least one light transmitting portion exterior to a body arranged to receive the parallel rays, including a deflector adapted to direct the parallel rays so that they impinge upon the interior of the light transmitting portion, the illuminated face possessing the esthetic effect, to an observer, of being suspended in air on rays of light. The deflector can be adjustable (e.g. tunable) and can comprise two hinged reflective faces which are capable of adjustment by raising or lowering a hinge linkage connecting the two faces. The deflector can have a corrugated surface comprising both primary and secondary reflective surfaces, the primary reflective surface being positioned so as to directly receive the parallel light rays and direct them toward the face and, the secondary surface being positioned so as to receive light reflected from the interior of the face and redirect it back on to the interior surface of the light-transmitting portion of the face.

3,605,310
ANIMAL IDENTIFICATION MARKER AND TOOL FOR APPLYING SAME
Edward A. Brown, 905 6th Ave., Dodge City, Kans. 67801
Filed May 13, 1968, Ser. No. 728,483
Int. Cl. G09f *3/00*
U.S. Cl. 40—301 2 Claims



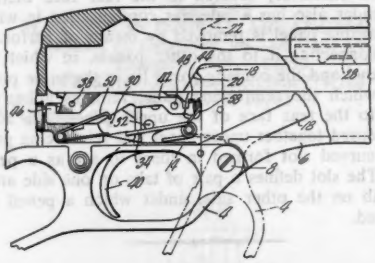
An animal identification marker and a tool for inserting it through a hole in an animal's ear. The marker has a generally arrow shaped head, an intermediate stem portion of reduced width which extends through the hole in the animal's ear, and a generally rectangular tail portion which extends transversely of the stem. The tool has a punch for forming a hole in the animal's ear, and a means for inserting the marker through the hole.

3,605,311
REMOVABLE FIREARM LOCK INSERTABLE IN THE FIREARM EJECTION PORT
Robert Hermann, P.O. Box 114, Stronghurst, Ill. 61480
Filed Jan. 22, 1969, Ser. No. 793,006
Int. Cl. F41c *27/00*
U.S. Cl. 42—1N 1 Claim



A device for placement into the ejection port or opening of a gun which will have a key for advancing a bolt that will prevent the removal of the device from the gun, thus rendering the gun unfireable.

3,605,312
LEVER ACTUATED SAFETY MECHANISM FOR A FIREARM
Robert E. Domian, Tolland, Conn., assignor to Colt's Inc., Hartford, Conn.
Filed July 15, 1969, Ser. No. 841,836
Int. Cl. F41c *17/02, 17/08*
U.S. Cl. 42—70E 11 Claims

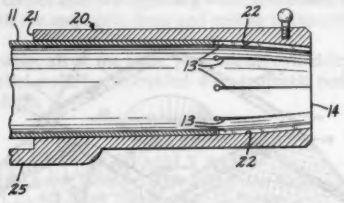


A lever actuated safety mechanism for a firearm of the general type having a bolt assembly reciprocatably operable responsive to arcuate movement of a cocking lever, and further having a trigger mechanism to release the hammer from the cocked position including a releasable member normally engaging the trigger mechanism to preclude the release by the trigger mechanism the hammer from the cocked position until the cocking lever engages the releasable member for a small arc of lever rotation to disengage the releasable member from the trigger mechanism, thereby permitting the operation of the trigger mechanism to release the hammer from the cocked position.

3,605,313
CHOKE MEANS
Jeremiah J. Kranz, 3620 Jefferson St., Rapid City, S. Dak. 57701
Filed Feb. 6, 1969, Ser. No. 797,149
Int. Cl. F41c *21/18;* F41f *17/12*
U.S. Cl. 42—79 4 Claims

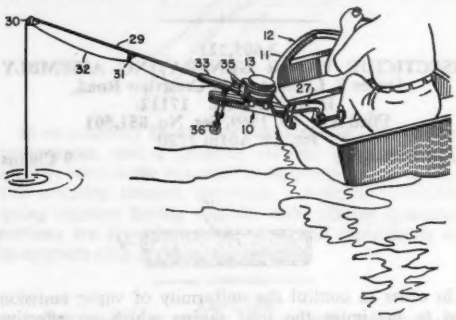
A tubular member coaxially fitted over the muzzle and a slotted portion of a gun barrel in longitudinally sliding engagement therewith having an arcuately converging

inner surface for forcing the slotted portions of the gun barrel inwardly to vary the choke thereof and supporting



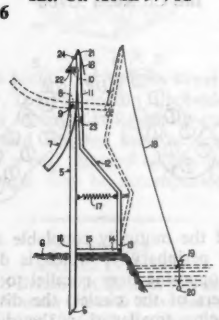
the slotted portions of the gun barrel along substantially every portion of the curve therein.

3,605,314
AUTOMATIC FISHING DEVICE
William M. Sarns, Rte. 2, Morley, Mich. 49336
Filed Oct. 29, 1969, Ser. No. 872,071
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **3 Claims**



An automatic fishing device in which a pole is operatively connected to the trigger of an automatic reel in a relationship such that downward deflection of the pole in response to the action of a fish will release the reel to the action of its spring mechanism, causing tension to be applied to the fish line.

3,605,315
AUTOMATIC FISH CATCHER
Lenard P. Adams and Roy S. Adams, both of 2126 56th St., Dallas, Tex. 75216
Filed July 18, 1969, Ser. No. 856,228
Int. Cl. A01k *97/12*
U.S. Cl. 43—16 **2 Claims**

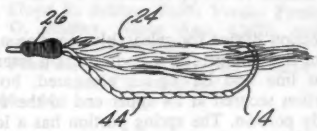


An automatic fish catcher which embodies a spring-loaded structure having a vertically-disposed member in the form of a tube that has its lower end either inserted in the ground or secured to the gunwale of a boat. An elongated Z-shaped member is hinged at the end of a lower leg thereof to a member extending horizontally outwardly from the tube and has an upper leg spring-biased against the tube. A trigger is pivoted intermediate its ends on the tube and has a roller at one end biasing the Z-shaped member away from the tube in the set position of the device with a fishing line secured to the said one end of the trigger and freely passing through an eye on the upper end of the Z-shaped member. A pull on the line will release the trigger to set the hook and the trigger movement will notify the fisherman that he has a bite.

3,605,316
COTTONSEED FISH BAIT TABLETS
William P. Rogers, Box 1297, Little Rock, Ark. 72203
Filed Feb. 28, 1969, Ser. No. 803,486
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.06 **2 Claims**

This invention relates to the configuration and method of production of a fish bait material in tablet form.

3,605,317
WEIGHTLESS, WEEDLESS FISHING FLY
John R. Pobst, 2701 Forest Lake Drive, Jackson, Mich. 49203
Filed Sept. 4, 1968, Ser. No. 757,319
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.25 **7 Claims**



A fishing lure of the fly fishing type comprising a hook having a shank portion adjacent the hook eye to which the fly material is affixed. The barbed end of the hook is in general alignment with this shank portion and the fly material extends toward and shields the barb. The weight, shape and distribution of the fly material is so related to the hook configuration, that the majority of the weight of the hook and lure lies below the fly material causing the hook to function as a keel.

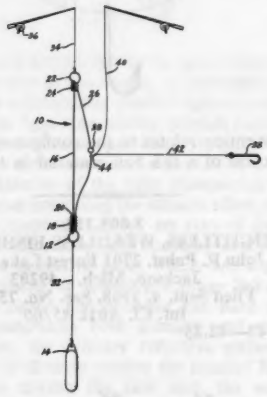
3,605,318
WEEDLESS FISHHOOK
Mona Santo and Michael W. Santo III, both of 47 Lake Drive, Roosevelt, N.J. 08555
Filed Mar. 27, 1970, Ser. No. 23,224
Int. Cl. A01k *83/00*
U.S. Cl. 43—43.4 **4 Claims**

This invention relates to a fishhook in which the point is shielded by a resilient guard member looped over the

barb at the point end of the hook and said guard member being extended to and through the eye of the hook and said guard member being further extended to and around

a barb located on the shank portion of the hook to preclude snagging of the hook when drawn through weeds and the like.

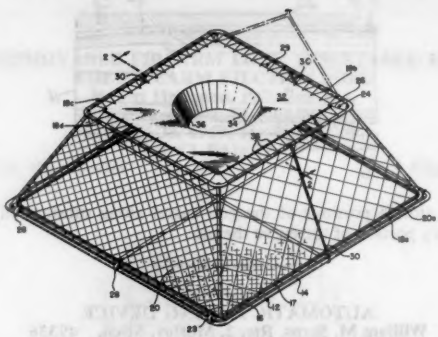
3,605,319
CONNECTOR FOR RELEASABLY SECURING A FISHING LINE TO A WEIGHT LINE
James Robert Griffith, 1446 Melvin Drive, Toledo, Ohio 43615
Filed Mar. 28, 1969, Ser. No. 811,552
Int. Cl. A01k *91/00*
U.S. Cl. 43—43.12 **8 Claims**



A connection device for releasably securing a fish line to a weight line comprising a body portion interposed in the weight line and having an elongated, bow-shaped spring portion secured at its upper end to the upper end of the body portion. The spring portion has a lower free end engaged in a coil ring structure at the lower end of the body portion. An intermediate portion of the fish line is slidably secured to the spring portion by a loop in the fish line. The fish line can be released from the spring portion by either a generally upward or right-angular pull on the fish line, which pulls the free end of the spring portion from the coil ring, but is prevented from release therefrom by a generally downward pull on the fish line.

3,605,320
CRAB TRAP
Charles S. Wells, Pier 56, Seattle, Wash. 98101
Filed Aug. 6, 1969, Ser. No. 848,023
Int. Cl. A01k *69/08;* **A01m** *23/08*
U.S. Cl. 43—65 **4 Claims**

Four upwardly converging side members of crab-restraining netting are joined to top and bottom members of like netting to form a container suitable for holding crab or the like. The top member is provided with a plastic shield having a substantially horizontal surface surrounding a downwardly sloping circular tunnel. The tunnel terminates in an entrance opening a substantial distance above the bottom member. The shield is of an imperforate

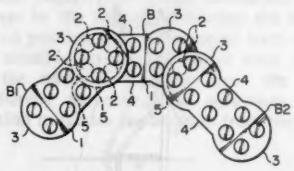


low-friction plastic so that the crab cannot gain a claw-hold to climb back out through the tunnel.

3,605,321
INSECTICIDE VAPOR GENERATING ASSEMBLY
Stokes S. Lazarus, 4340 Crestview Road, Harrisburg, Pa. 17112
Filed Aug. 19, 1969, Ser. No. 851,501
Int. Cl. A01m *1/20*
U.S. Cl. 43—131 **9 Claims**

In order to control the uniformity of vapor emission and to maximize the time during which an effective amount of vapor emission occurs, an absorbent body is impregnated with vaporizable material and is completely surrounded by a vapor-permeable plastic sheath which does not enter into a solubility relationship with the vaporized material and therefore controls the rate of vapor emission.

3,605,322
INTERLOCKING TOY BLOCKS
Takashi Matsubayashi and Hirozo Matsubayashi, Habikino-shi, Osaka, Japan, assignors to Nintendo Playing Card Co., Ltd., Kyoto-shi, Kyoto, Japan
Filed Apr. 22, 1969, Ser. No. 818,353
Claims priority, application Japan, May 13, 1968, 43/39,019
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 **2 Claims**



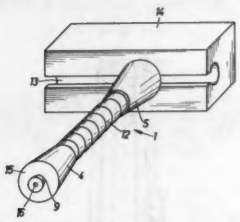
Each block of the mutually couplable assembling toy has a plate the periphery of which is defined by two circles and two opposing lines parallel to a straight line joining the centers of the circles, the distance between the two lines being smaller than the diameter of the circles.

The upper surface of the plate is provided with a plurality of cylindrical projections equally spaced apart to one another and in two rows in parallel.

The lower surface of the plate are provided with two cylindrical walls positioned in alignment with the respective circles and two opposing walls positioned in alignment with the respective lines and ending to the cylindrical walls.

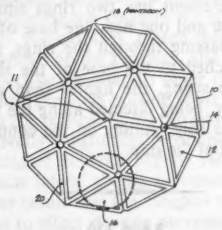
Preferably, all of the plate, projections, cylindrical walls and parallel walls are moulded with synthetic resin in an integral form.

3,605,323
ASSEMBLY KIT
Artur Fischer, 219 Altheimer Str., D–7241 Tumlingen, Germany
Filed Aug. 19, 1969, Ser. No. 851,233
Claims priority, application Germany, Aug. 20, 1968, P 17 28 064.7
Int. Cl. A63h *33/10*
U.S. Cl. 46—26 **9 Claims**



In an assembly kit are provided a plurality of structural components, and a coupling element for coupling respective ones of the structural components to one another. The coupling element comprises a helically convoluted spring member having opposite ends. Mating connecting portions are provided on the structural components and on opposite ends of the spring member.

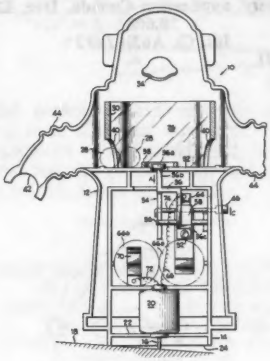
3,605,324
POLYHEDRONS HAVING DEPRESSIBLE VERTICES AND INTERNAL MEANS FOR RESTORING SHAPE
Wilbur Henry Adams, 66 E. 83rd St., New York, N.Y. 10024
Filed Mar. 7, 1968, Ser. No. 711,263
Int. Cl. A63h *5/00, 29/08*
U.S. Cl. 46—42 **4 Claims**



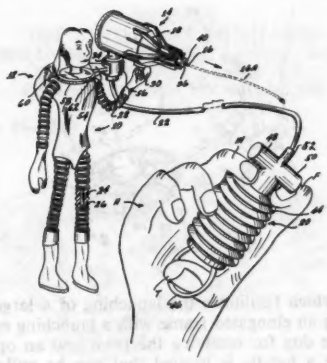
A sixty-sided hollow polyhedron structure is described for use as a toy. The polyhedron is provided with substantially stationary vertexes and radially movable vertexes. Inwardly-depressed vertexes may be popped outwardly with the use of a ball retained within the structure. The outward movement may be accompanied by a popping sound.

3,605,325
ANIMATED TOY
Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates
Filed June 20, 1969, Ser. No. 835,154
Int. Cl. A63h *29/08*
U.S. Cl. 46—42 **9 Claims**

An animated toy which includes a hollow upper body portion, a lower base portion and a drive means for rotating the toy about a pin means which extends downwardly beyond the lower extremities of the base portion. The body portion has an interior receiving area with an access opening through the body portion, and an actuator is position in the receiving area to actuate the drive means to move the toy when an object is deposited in the receiving area through the access opening and the object comes in contact with the actuator. A discharge opening remote from the access opening extends through the body portion so that rotation of the toy has a tendency to discharge objects from the receiving area through the discharge opening. the actuator is of a relatively small size so that only those objects which are deposited in the area in such a manner as to contact the actuator will cause the toy to rotate. The toy will continue to rotate until a manual shut-off means on the exterior of the toy is engaged to stop the drive means. The lower marginal periphery of the base portion has an irregular shape to effect uneven movement of the toy as it rotates about the downwardly extending pin means.



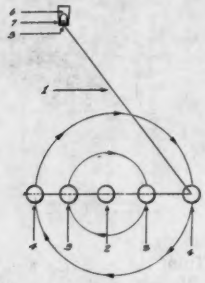
3,605,326
STRING PROJECTING TOY
Albert R. Baginski, Torrance, David T. Okada, Hermosa Beach, Floyd E. Schlau, Palos Verdes Peninsula, and Edwin O. Stastny, Santa Ana, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 30, 1969, Ser. No. 795,224
Int. Cl. A63h *29/16*
U.S. Cl. 46—44 **8 Claims**



A spaceman toy comprising a spaceman figure and a pneumatically powered space probe or gun mounted on

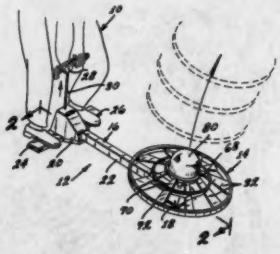
him, which projects and retracts a string. The gun includes a chamber with a long narrow passageway through which the string extends, and a hand pump is coupled by a tube to the chamber to apply compressed air or a vacuum to the chamber to project or retract the string.

3,605,327
WHIRLING BALLS TOY
Ronald A. Jones, Laval, Quebec, Canada (470 Cambridge St. 401 Ottawa, K1S4H8, Ontario, Canada)
Filed Mar. 3, 1969, Ser. No. 803,645
Claims priority, application Canada, Dec. 23, 1968, 38,608
Int. Cl. A63h *1/32*
U.S. Cl. 46—51 8 Claims



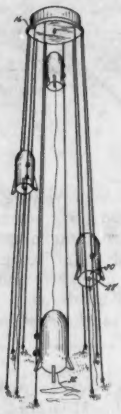
A toy for manual operation comprising a handle, a string to be supported at one end by the handle and a number of balls fixed to said string near the other end thereof such that a rotating wrist action imparted to the handle will cause the depending balls to whirl in a plane passing through the ball fixed closest to the handle lengthwise of the string.

3,605,328
ROTOR LAUNCHING TOY
Eugene J. Kilroy, Jr., Inglewood, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 10, 1969, Ser. No. 883,862
Int. Cl. A63b *27/00*
U.S. Cl. 46—83 4 Claims



A toy which facilitates the launching of a large rotor, comprising an elongated frame with a launching end having a drive dog for receiving the rotor and an operating end where a handle is located that can be pulled by a child to rotate the drive dog and launch the rotor. The axis of the drive dog is angled away from the vertical so that the rotor will not hit a child at the operating end. The launching mechanism includes a cable having one end normally wound around a spool fixed to the drive dog, and an opposite end extending through the frame to the operating end, where it is attached to a handle. A child launches a rotor by placing his feet on a pair of foot rests at the operating end of the frame, and pulling up on the handle which is attached to the cable.

3,605,329
INFLATABLE TOY SIMULATING SPACE STATION AND SHIP
Aloysius Dalli, 37 Crescent St., Long Island City, N.Y. 11101
Filed Aug. 5, 1970, Ser. No. 61,146
Int. Cl. A63h *27/00, 3/06*
U.S. Cl. 46—87 6 Claims

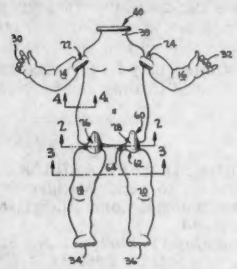


An aerial toy simulating a space station in a space ship. The space station element is inflated with a lighter than air gas and secured to the ground by means of guide strings. A ship element has two rings situated thereon, one near the nose and one near the base of the unit, one of the tie-lines passing through the rings, and a control string being attached to the base of the ship. Upon releasing the guide string, the lighter than air space ship will rise upwardly, being directed along the tie-line by the rings to the space ship; pulling on the control string will reverse the ascent of the ship.

3,605,330
FOAMED DOLL WITH APPENDAGES SECURED BY COLUMNAR, CELLULAR PORTIONS PROVIDING TORSIONAL AND UNIVERSAL ANGULAR MOVEMENT THERETO
Charles Sivelle, Huntington Station, and Mark M. Schaffer, Roslyn Heights, N.Y., assignors to Dublon, Incorporated, Newark, N.J.
Continuation of application Ser. No. 620,474, Mar. 3, 1967. This application Jan. 15, 1968, Ser. No. 698,049
Int. Cl. A63h *3/26*
U.S. Cl. 46—159 3 Claims

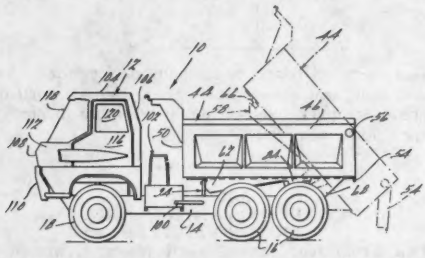
A shaped foamed article including a body and at least one appendage secured to the body by a connecting portion of columnar nature, in which the body, appendage and connecting portion are integrally formed with a smooth outer skin and a cellular interior in such manner that the connecting portion has the cellular nature of its interior maintained, and in which the connecting portion,

by virtue of its columnar nature and structure permits movement of the appendage attached to the body thereby



in a plurality of different directions about a plurality of different axes with substantially equal ease.

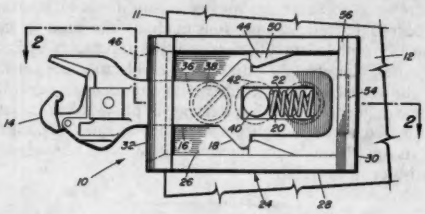
3,605,331
TOY VEHICLE
Robert S. Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Filed Dec. 9, 1968, Ser. No. 782,113
Int. Cl. A63h *17/05*
U.S. Cl. 46—201 **13 Claims**



A toy vehicle comprising a chassis portion, a body portion and at least two steerable wheels; the chassis portion being provided with a steering mechanism including a tie rod extending generally laterally thereof, means supporting the tie rod for lateral sliding movement, a pair of kingpins disposed adjacent the opposite ends of the tie rod, means supporting the kingpins for pivotal movements about generally vertical axes, means rotatably supporting the steerable wheels on the kingpins, and pivot arm means pivotably connecting the laterally outer ends of the tie rod with the kingpins; the body portion being supported on the chassis portion for relative tilting movement about an axis extending generally longitudinally of the chassis portion, whereupon tilting of the body portion relative to the chassis portion effects lateral sliding movement of the tie rod, with the further result that the kingpins will be pivoted in a manner so as to effect steering movement of the vehicle wheels; the vehicle having the chassis and body portions initially, substantially preassembled and adapted to be operatively connected by merely snappingly engaging a pair of resilient bearing members provided on the body portion into engagement with a longitudinally extending pivot member or shaft provided on the chassis portion.

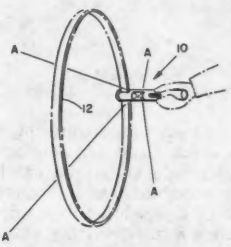
3,605,332
DRAFT GEAR ARRANGEMENT FOR MINIATURE RAILWAY ROLLING STOCK
Thaddeus Stepek, Rockville, Md., assignor to Atlas Tool Co., Inc., Hillside, N.J.
Filed Jan. 16, 1970, Ser. No. 3,337
Int. Cl. A63h *19/00*
U.S. Cl. 46—216 **3 Claims**

A draft gear box or coupler pocket arrangement is provided for permanent attachment at the lower ends of miniature railway rolling stock, such as boxcars, to receive couplers whose well known purpose it is to enable the coupling of cars into trains. A spring is provided to maintain the coupler in a centered position. This is a requisite when automatic coupling devices are employed.



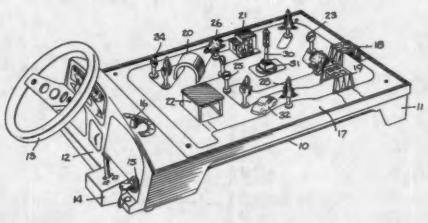
The coupler pocket or draft gear box arrangement is so arranged as to allow the rapid removal of its coverplate, for purposes of replacing broken couplers, without need for the removal of the entire draft gear system or any screws or other fastening devices.

3,605,333
HOOP TRUNDLERS WITH BUILT-IN ILLUMINATING MEANS
James D. Copeland, 148 Degrassi St., Toronto 8, Ontario, Canada
Filed Oct. 30, 1968, Ser. No. 771,833
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 **1 Claim**



A trundler or propelling device for propelling a child's hoop is provided with a passage through which the hoop is slidingly received and with a built-in illuminating means, such as a battery-powered lamp, to provide an additional feature for diverting and amusing the child user, and also acting as a warning to the drivers of any motor vehicles approaching a child playing with the hoop on a roadway.

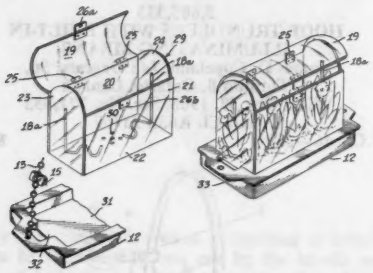
3,605,334
TOY AUTO DRIVE SIMULATOR
Robert Genin, Scarsdale, N.Y., assignor to Child Guidance Toys Inc., Bronx, N.Y.
Filed May 26, 1969, Ser. No. 827,545
Int. Cl. A63h *29/22*
U.S. Cl. 46—240 **5 Claims**



A toy auto drive simulator in which the movement of a miniature auto on a scenic board having various routes thereon is controlled by a hidden carriage underlying the

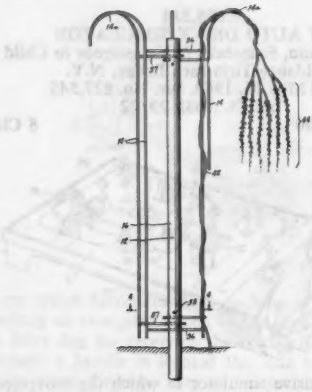
board. The carriage is movable under the control of a driver in the X and Y coordinates, and carries a permanent magnet. The magnet is positioned adjacent the underside of the board and acts to attract a ball bearing held captive in a socket under the front end of the auto, whereby as the carriage moves in any direction, the auto is caused to follow suit. Inasmuch as the auto is magnetically coupled to the carriage, the linkage is invisible. In order, therefore, to make it possible to place an auto on the board so as to couple it to the magnet, regardless of carriage position, the carriage is provided with an illuminated arrow which points to the magnet. The arrow is visible through the board, which is made of semi-translucent material.

3,605,335
PLANTER KIT
Elizabeth Anne Ulvang Maitland, 15709 Chatham, Detroit, Mich. 48223
Filed Dec. 2, 1968, Ser. No. 780,376
Int. Cl. A01g *9/22*
U.S. Cl. 47—17 **1 Claim**



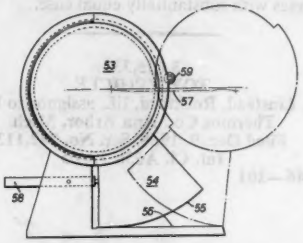
A kit including parts for constructing a transparent pet plantation in which plants can be placed for growth in sunlight, the kit including several panels of clear Plexiglas which is assembled into a container, a plurality of hinges, a roll of tape, glue, two plastic tubings, a tray, metal rings, clips, a latch assembly, chain and a carton of cardboard within which the kit is contained.

3,605,336
FRAME FOR GROWING HOPS OR THE LIKE
Sidney S. Meisler, 3702 Richey Road, Yakima, Wash. 98902
Filed Mar. 24, 1969, Ser. No. 809,532
Int. Cl. A01g *17/06*
U.S. Cl. 47—45 **2 Claims**



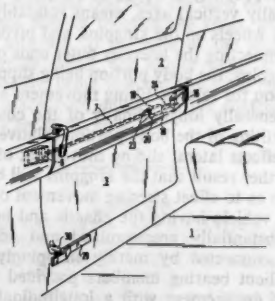
A frame for growing hops or the like comprises a number of standards disposed substantially perpendicular to the ground, the standards at their upper ends extending outwardly and preferably downwardly. As the vines grow upwardly on the standards, the vines reach the upper portion of the standards and continue their growth outwardly and downwardly, thus making the hops more readily harvestable. The frames may be arranged in a pattern conducive to mechanical treating and harvesting of the hops.

3,605,337
CLOSURE MEMBER ARRANGEMENTS
Wilfred Newrick Rodgers, Mickleover, England, assignor to International Combustion (Holdings) Limited, London, England
Filed May 15, 1969, Ser. No. 825,003
Int. Cl. E06b *3/34*
U.S. Cl. 49—41 **11 Claims**



This invention relates to coupling devices for forming a fluid tight seal between two parts, and has particular reference to quick release couplings for use in pipelines or for closure members.

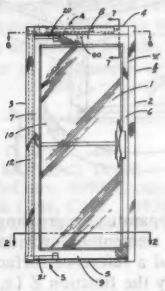
3,605,338
SLIDING DOOR, PARTICULARLY FOR MOTOR VEHICLES
Alfred Grossbach, Tamm, Wurttemberg, Germany, assignor to Firma Lunke & Sohn, Witten (Ruhr), Germany
Filed Sept. 29, 1969, Ser. No. 861,770
Claims priority, application Germany, Sept. 30, 1968, P 17 80 577.5
Int. Cl. E05d *15/10*
U.S. Cl. 49—212 **14 Claims**



A sliding door for motor vehicles has a body comprising an outer skin and an inner lining. When opened, the door is first swingable into an intermediate position, by a carrier device including a carrier arm articulated on the vehicle body, for pivoting about a vertical axis, and the door is then slidable longitudinally of the vehicle body through the medium of a slide guide means. A single horizontally oriented slide guide extends the full length of the door on the inner lining and externally of the door body. The single slide guide is mounted on the door body by carrier parts. The slide guide has at least its upper and inner surfaces enclosed in a longitudinal cover which may

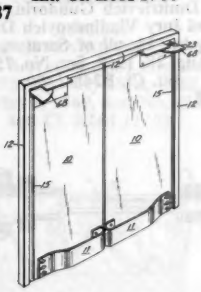
be upholstered to serve as an arm rest, forming a continuation of an arm rest adjacent a vehicle seat. The slide guide encloses door lock operating means effective at both the front and rear edges of the door. A slide is movable along the slide guide on suitable rollers and is connected to a carrier arm forming part of the carrier device.

3,605,339
MANUAL BALANCED DOOR
John C. Catlett and James R. Gilson, Memphis, Tenn., assignors to Gyro Tech, Incorporated, Memphis, Tenn.
Continuation-in-part of application Ser. No. 625,246, Mar. 22, 1967. This application May 6, 1969, Ser. No. 822,254
Int. Cl. E05l *11/24, 15/02, 15/10*
U.S. Cl. 49—340 **13 Claims**



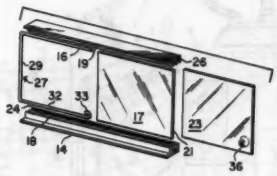
A manually balanced door comprising a door having a balanced hinge arrangement wherein each hinge point is provided with a unique bearing assembly comprising, in combination, thrust bearings, needle bearings and self-aligning bearings; there being a door operator adapted for actuation pursuant to manually initiated swinging of the door which operator incorporates means for controlling the speed of swing through the opening and closing arcs of movement and further embodies a resilient member for storing of energy during opening movement to effectuate closing upon release thereof.

3,605,340
DOOR CHECKING AND CONTROLLING DEVICE
John E. Nolan and Rudolph J. Wiplinger, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 2, 1970, Ser. No. 7,802
Int. Cl. E05f *1/00*
U.S. Cl. 49—387 **18 Claims**



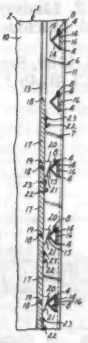
A door controlling apparatus incorporated in and designed to control the opening and closing of doors, particularly heavy doors of the types commonly used in factories. The apparatus performs several controlling functions, including holding the door in a closed position until a predetermined opening torque is applied to the door, allowing relative ease of continued opening of the door compared to the torque required to initiate opening, braking the opening swing of the door at a predetermined point, and maintaining the door in an open position for a predetermined period of time prior to closing the door in a controlled manner. All of these functions are performed utilizing the energy applied to open the door.

3,605,341
PORTABLE SLIDING WINDOWS FOR AUTOMOBILES
Glennis R. Puckett, Rte. 2, Box 850, Somerville, Ala. 35670
Filed July 24, 1969, Ser. No. 844,547
Int. Cl. E05b *13/00;* **E06b** *3/46*
U.S. Cl. 49—413 **4 Claims**



A portable sliding window device for automobiles formed of sliding window parts and top and bottom channel groove pieces serving to lock the device into the automobile door window opening and wherein the locking is effected by a simple U-shaped locking member adapted to be snapped into the channel grooves and its bight portions being locked into the groove of the window opening support at the rear edge of the door opening. The inner sliding door is slidable in the channel grooves and can be slid by the use of a knob on one of the wiindow pieces between open and closed positions.

3,605,342
CONTINUOUS DOOR COLUMN AND DOOR SYSTEM FOR SILOS
Robert F. Koser, Almena, Wis., assignor of fractional part interest to Ralph H. Koser, Almena, Wis.
Continuation of application Ser. No. 847,079, Aug. 4, 1969. This application July 27, 1970, Ser. No. 58,306
Int. Cl. E05c *21/02;* **E06b** *3/22*
U.S. Cl. 49—464 **14 Claims**



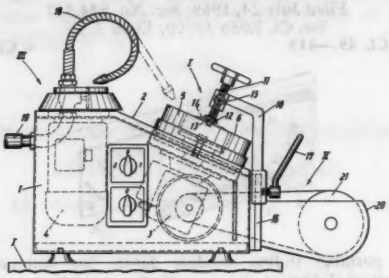
Frame structure for mounting in a door opening through a silo wall extending vertically for the greater portion of the height of the silo comprising vertically extending laterally spaced longitudinal frame members connected by vertically spaced horizontal cross frame members and opposed longitudinal stop flanges on the longitudinal frame members. A plurality of removable door sections are disposed in end-to-end abutting engagement and held against the stop flanges by wedge elements engaging the cross frame members.

3,605,343

MACHINE FOR PROCESSING OF KNIVES, IN PARTICULAR OF CUTTER KNIVES AND CARVING KNIVES

Fritz Knecht, Mottelinstrasse, D–798 Ravensburg, Germany

Filed Dec. 11, 1969, Ser. No. 884,198
Claims priority, application Germany, Dec. 14, 1968, P 18 14 799.4
Int. Cl. B24b 7/00
U.S. Cl. 51—3 12 Claims



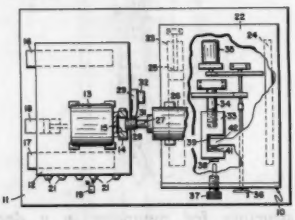
A machine for processing of knives particularly of cutter knives and knife-blades having a handle, which comprises a housing including an inclined face and an upper horizontal face, as well as a vertical part. A grinding device, a band grinding device including a grinding band and a lap device are provided. The housing receives the devices and the grinding device is rotatably mounted on the inclined face of the housing. The lap device includes a lap disk and is disposed on the upper horizontal face of the housing. A drive shaft is mounted in the housing and the grinding band is disposed on the vertical housing part, and swingably mounted parallel to the wall of the housing about the axis of the drive shaft.

3,605,344

GRINDING MACHINE

Robert S. Hahn, Northboro, Edward G. Robillard, Cherry Valley, and Richard P. Lindsay, Marlboro, Mass., assignors to The Heald Machine Company, Worcester, Mass.

Filed Nov. 24, 1969, Ser. No. 879,452
Int. Cl. B24b 53/04
U.S. Cl. 51—5 6 Claims



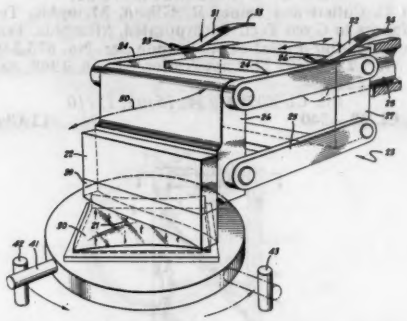
This invention relates to a grinding machine and, more particularly, to apparatus for generating a surface of revolution by the abrasive process, wherein means is provided for assuring that the amount of material removed from an abrasive wheel during a dressing operation is the same, irrespective of variations in the amount of wear on the wheel.

3,605,345

LENS SURFACE GRINDING METHOD AND APPARATUS

William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.

Filed June 9, 1969, Ser. No. 831,437
Int. Cl. B24b 5/00
U.S. Cl. 51—67 18 Claims



A method and apparatus for grinding a complex optical surface on a lens element to provide between the lens element surface and a reference surface, a lens thickness variation defined by the function Z (x, y) where x and y form a coordinate system in which the function Z (x, y) defines the lens element thickness at any point (x_n, y_m), the function Z (x, y) rotatable to a coordinate system of coodinates x' and y' in which the function

$$Z(x', y') = f(x') + f(y')$$

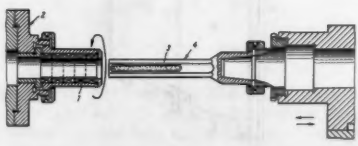
A grinding tool having a bearing surface defined by the function f is scraped across the lens element surface in the presence of an abrasive, in the direction of the coordinates of the $x'-y'$ coordinate system successively, with resilient pressure applied to the tool in the direction of the lens element surface.

3,605,346

METHOD OF ABRASIVE TREATMENT OF SURFACES OF BEARING RACES MADE OF HARDENED STEEL

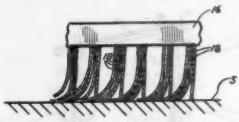
Alexandr Ivanovich Sprishevsky, Sharikopodshipnikovskaya ul. 32, kv. 30, Moscow, U.S.S.R; and Sergei Georgievich Redko, Naberezhnaya kosmonavtov 2, kv. 19; Venlamin Dmitrievich Gundorin, Nagorny proezd 2/1, kv. 20; and Jury Vladimirovich Dubrovsky, Ulitsa Sovetskaya 23, kv. 11, all of Saratov, U.S.S.R.

Filed Aug. 28, 1968, Ser. No. 756,049
Int. Cl. B24b 1/00
U.S. Cl. 51—290 1 Claim



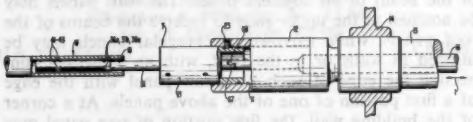
An abrasive tool in the form of radially adjustable bars is advanced in a longitudinal direction, at a speed of between 1 and 10 m./min., in advance and withdrawal strokes to machine a bearing race which is rotated at a peripheral speed of 180–200 m./min. The tool undergoes transverse movement, after each double stroke, in an amount of 5–10 μm. per longitudinal stroke of the tool.

3,605,347
FLOOR SCRUBBING BRUSH
Robert M. Barry, St. Paul, Minn., assignor to Multi-Clean Products Incorporated, St. Paul, Minn.
Filed Mar. 27, 1970, Ser. No. 23,318
Int. Cl. B24b *23/02*
U.S. Cl. 51—330 4 Claims



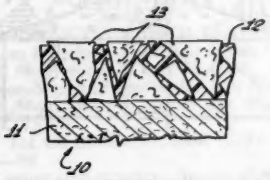
A brush for use in a rotary type floor scrubbing machine comprising a flat backboard having bristles impregnated with an abrasive material attached to the backboard and extending therefrom at random lengths with the majority varying in the range of 10 percent to 25 percent from the median length.

3,605,348
HONING TOOL
Charles W. McClure, 5992 Gardendale Ave., South Gate, Calif. 90280
Filed Sept. 17, 1969, Ser. No. 858,815
Int. Cl. B24b *9/02*
U.S. Cl. 51—338 8 Claims



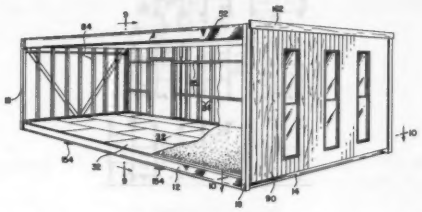
A honing tool for attachment to a rotatable adapter on a honing machine which includes a slotted tubular mandrel for supporting honing stone assemblies for radial movement by the camming action of longitudinal ribs on a cam shaft rotatably disposed within the mandrel. Cam means are operatively associated with the cam shaft which are actuated by an axially reciprocating actuating element connected to the honing machine so as to rotate the cam shaft alternately in opposite directions during the stroking of the actuating element to expand and retract the honing stone assemblies as the honing tool is rotated by the honing machine adapter.

3,605,349
ABRASIVE FINISHING ARTICLE
Frederick B. Anthon, Los Angeles, Calif. (P.O. Box 1759, Beverly Hills, Calif. 90213)
Filed May 8, 1969, Ser. No. 823,084
Int. Cl. B24d *11/02*
U.S. Cl. 51—402 9 Claims



Discloses an abrasive polishing or finishing article consisting of a backing layer made of chamois leather, or equivalent, porous to slurries such as water or oil, and coated on the fornt surface with a matrix consisting of a thermoplastic, flexible binder, in which are embedded abrasive particles oriented in large part with plane faces thereof facing upwards to engage the surface to be polished. The abrasive incorporating thermoplastic coating is preferably disposed in a pattern of "islands," so as to leave channels therebetween for circulation of slurry.

3,605,350
MODULAR HOUSING STRUCTURE
William Stewart Bowers, 22800 76th W., Edmonds, Wash. 98020
Filed June 3, 1969, Ser. No. 829,887
Int. Cl. E04b *1/348*
U.S. Cl. 52—16 17 Claims

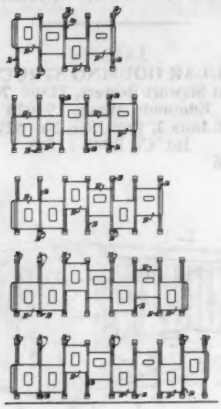


A modular structure specifically designed for use as portable school rooms comprises at least two modular end sections, each having a steel framework consisting of a base frame, corner posts secured to the base frame, a roof frame secured to the corner posts, prefabricated, non-load bearing side and end walls, and clamping means adapted to mechanically clamp the adjacent inner edges of the two modular end section roof frames, thus to butt the inner side of the adjacent base frames and the adjacent inner corner posts tightly together such that the section roofs, floors and side walls will be joined to provide an integral structure. Each modular section is specially adapted to be plant fabricated and transported to the site and there hoisted onto a peripheral foundation. The modular structures are designed such that an open-span relocatable structure is formed and construction tolerances are made not critical without sacrificing structural rigidity and weather-tightness. A diagonal framing member is provided to allow the module perimeter to overhang the foundation. Horizontal plates are welded to one module for supporting a side of the other. Other features include tubular posts concealing the downspouts, inset beams for ease of wall construction, steel pockets for receiving foundation posts, and the use of reinforcing rods welded to the steel structure at critical stress points to increase the strength and rigidity of the steel.

3,605,351
TELESCOPING AND LATERALLY-MOVABLE MOBILE HOME SYSTEM
Jon D. Vredevoogd, 314 Clinton Ave., Brooklyn, N.Y. 11205
Filed May 22, 1969, Ser. No. 826,927
Int. Cl. E04b *1/343*
U.S. Cl. 52—29 7 Claims

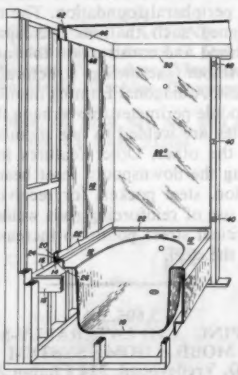
The present mobile home is transported on a standard flatbed truck and constitutes a number of segments which are adapted to be telescoping and have all components stored inside. Once the mobile home dwelling is on the selected site, the truck is pulled away and the entire mobile home is lowered to the desired level elevated from the ground by adjusting hydraulic cylinders inside vertical supports for the transverse girders. The transverse girders are provided so that the segments of the

mobile house may be selectively moved laterally as well as being telescoped. This permits the staggering of the segments which opens up gaps along the exterior thereof into which window units may be inserted. Continuous



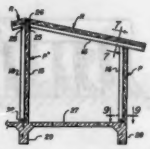
tracks on the interior walls support the cabinets and other equipment in the mobile home, as well as functioning as electrical plug-in strips which serve all appliances and most lighting fixtures in the mobile home.

3,605,352
BATHTUB AND SHOWER SURROUND
Kay L. Ruggles and Norman van Skyhawk, Salt Lake City, Utah, assignors to American Standard Inc., New York, N.Y.
Continuation of application Ser. No. 741,679, July 1, 1968. This application Dec. 12, 1969, Ser. No. 874,663
Int. Cl. A47k *3/08, 3/23*
U.S. Cl. 52—35 **5 Claims**



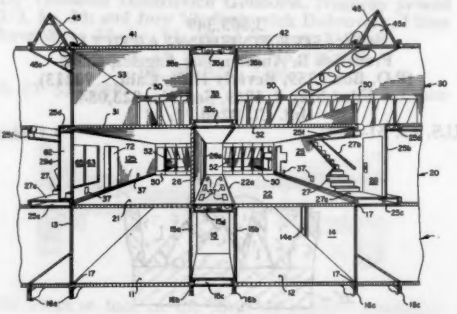
This invention comprises making a tub from resin-bonded glass fibers or a resin with an inorganic filler, which is pre-dimensioned, and a shower surround adapted to be associated therewith to form a water-tight enclosure with the tub. The tub and shower surround are provided with improved joints which will be under tension when assembled as an integrated tub and shower unit to make it leak-proof and which will be free from any shearing stresses being exerted on any caulking or other adhesives used with the joints after the unit is assembled.

3,605,353
BUILDING PANEL AND BUILDING CONSTRUCTION
Gordon L. Marcott, 1365 Columbine St., Denver, Colo. 80206
Filed May 1, 1969, Ser. No. 828,073
Int. Cl. E04b *7/02, 5/02*
U.S. Cl. 52—91 **1 Claim**



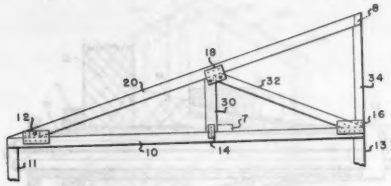
A building construction panel is molded and formed primarily of relatively light weight material, having a planar first portion of uniform thickness and a second or beam portion along the lateral edge of the first portion, the beam being thicker than and offset at one side from the first portion and also having a notch in lateral alignment with the first portion to receive an edge of an abutting panel. The beam is provided with primary reinforcing rods extending longitudinally therewithin, while secondary reinforcing, such as wire mesh, is embedded within the first portion and extends laterally into the beam. The walls and/or roof and/or floor of a building may be constructed from such panels, with the longitudinal end or first portion of one panel being received in the notch of the beam of an adjacent panel. The wall panels may be notched at the upper ends to receive the beams of the roof panels, while narrower, rectangular panels may be utilized in walls or in the roof, with an I-channel connecting the edge of such a narrow panel with the edge of a first portion of one of the above panels. At a corner of the building wall, the first portion of one panel may fit into the notch in a beam of a panel of the adjacent wall, while special panels whose beams have a planar end surface, i.e. without the notch, may abut a first portion of an adjacent wall panel at the corner.

3,605,354
CONSTRUCTION UNIT
Craig Hodgetts, 201 W. 77th St., New York, N.Y. 10024
Continuation of application Ser. No. 695,990, Jan. 5, 1968. This application Oct. 24, 1969, Ser. No. 869,395
Int. Cl. E04c *1/34, 1/348;* **E04h** *1/04*
U.S. Cl. 52—73 **17 Claims**



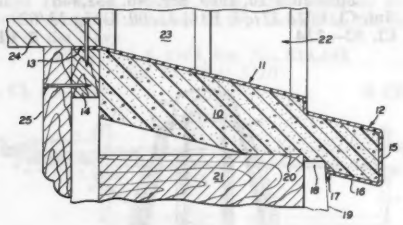
A building construction system using a core which contains at least one passage for utility services. Floor and ceiling panels are connected to the core, which serves as one side wall of a living unit or the side walls of the two adjacent units, and a dwelling can be constructed using an offset configuration of cores on adjacent floors.

3,605,355
ROOF STRUCTURE
Bobby J. Solesbee, Spartanburg, S.C., assignor to Mobilcraft Industries, Inc., Spartanburg, S.C.
Filed Apr. 4, 1969, Ser. No. 813,471
Int. Cl. E04b *1/32, 7/16*
U.S. Cl. 52—90 8 Claims



A roof structure for a dwelling, building or module therefor that is at least partially fabricated and then transported to the ultimate construction site, the roof structure of which has an improved construction to permit it to be collapsed during transit and then easily erected to a predetermined pitch at the construction site.

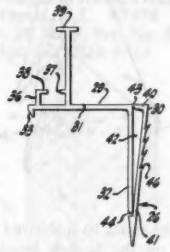
3,605,356
PREFABRICATED PLASTIC WINDOW SILL
Paul G. Bordner, Columbus, Ohio, assignor to Crane Plastics, Inc., Columbus, Ohio
Filed Apr. 6, 1970, Ser. No. 25,900
Int. Cl. E04d *13/00, 15/08*
U.S. Cl. 52—97 4 Claims



A prefabricated window sill of plural density, synthetic resin composition having a main body portion or core formed from a lightweight, expanded, cellular plastic material and a relatively thin, exterior skin or clad composed of a denser, rigid, weather-resistant plastic material. The window sill is sized and finished for installation in standard sizes of window openings without requiring cutting or other shaping thereof.

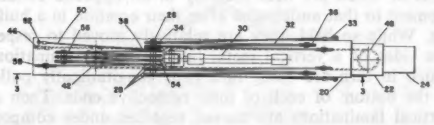
3,605,357
SEAL STRUCTURE WITH TEAR STRIP
William J. Stegmeier, Walnut Creek, Calif. (1021 C Shary Circle, Concord, Calif. 94520)
Continuation-in-part of application Ser. No. 761,726, Sept. 23, 1968. This application Apr. 25, 1969, Ser. No. 819,173
Int. Cl. E04b *1/41*; E04f *15/14*
U.S. Cl. 52—98 5 Claims

A seal or water stop structure for use along a concrete coping at the upper edge of a swimming pool and a method of molding such coping utilizing the seal structure. The seal structure includes an elongated seal component forming a permanent part of such swimming pool, and which component has a barrier element interposed between the upper edges of the pool and concrete coping overlying the same. The seal structure further includes a tear strip component frangibly attached to the seal component along a line of weakness for separation therefrom with a mold form after the concrete coping has been constructed. In the method of molding concrete coping, the side walls of the pool are first covered with tile or other water-impervious finish, and a disposable mold form having a surface portion thereof configurated in the finished shape to be imposed thereby upon the coping and having also an attachment portion equipped with a double-faced



pressure-sensitive tape is secured by means of such tape to the finished surface of the pool walls with the configurated surface portions of the mold form projecting thereabove. The seal structure is inserted between a part of the attachment portion of the mold form and pool wall, and is secured to each prior to a moldable mass of concrete being spread against the mold form. Upon curing of the concrete mass, the tear strip component of the seal structure is separated from the seal component thereof along such line of weakness, and such separation of the tear strip component is effective to strip the mold form from the pool walls and coping.

3,605,358
TELESCOPIC CRANE BOOM
Joseph T. Bentey, 5 Cliff St., West Orange, N.J. 07052
Filed Mar. 28, 1969, Ser. No. 811,564
Int. Cl. E04h *12/34*
U.S. Cl. 52—121 3 Claims

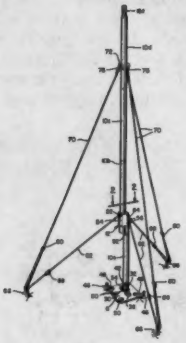


Outer tube having a cylinder thereon moving a carriage therealong, a multiple pulley system actuated by the carriage for propelling a middle tube out of the outer tube, and a pulley system on the middle tube actuated by propulsion thereof for propelling an inner tube out of the middle tube.

3,605,359
ANTENNA MAST CONSTRUCTION
Frank Bader, Stony Brook, and Martin J. Berger, Lake Ronkonkoma, N.Y., assignors to New England Merchants National Bank, Boston, Mass.
Filed Dec. 12, 1968, Ser. No. 783,281
Int. Cl. E04h *12/08, 12/20*
U.S. Cl. 52—146 4 Claims

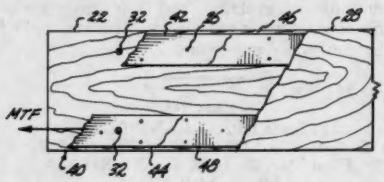
An antenna mast including a plurality of tubular mast sections and a vertical launch attachment adapted to be

installed upon the lowermost mast section. The attachment comprises a bracket through which the remaining mast sections are sequentially inserted and locked to ver-



tically "launch" the mast to a desired height. These mast sections are held on the launch bracket.

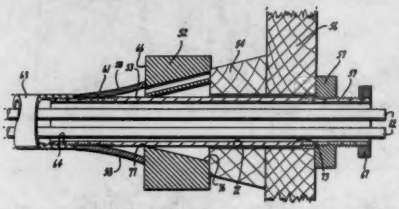
3,605,360
PRESTRESSED VERTICALLY LAMINATED BEAM OF WOOD
Skuli Walter Lindal, 3138 Mountain View W., Tacoma, Wash. 98466
Filed Apr. 24, 1969, Ser. No. 818,990
Int. Cl. E04c *3/10, 3/292*
U.S. Cl. 52—223 **1 Claim**



During the manufacture of beams, vertical laminations of wood are held securely in an opposite bending moment to that anticipated after their erection in a building. While so held, they are relatively moved to respective sides of a vertical metal lamination or laminations, which in turn are being optionally longitudinally pulled at the bottom of each of their respective ends. Then all vertical laminations are moved together under compressive forces and secured with fasteners. Optionally, the fasteners may be formed from and remain a part of the metal lamination or laminations. After securement by fasteners and then upon release from bending, pulling and compressive forces, the derived prestressed wood and metal beam is ready for inclusion in an overall structure.

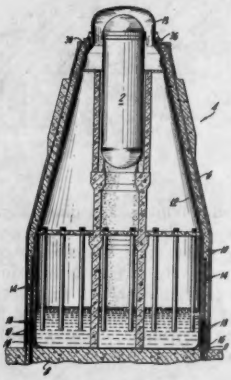
3,605,361
TENDON ANCHORAGE
George H. Howlett, Oakland, and James W. Howlett, Richmond Annex, Calif., assignors to Howlett Machine Works
Filed Apr. 16, 1969, Ser. No. 816,583
Int. Cl. E04c *5/12;* **F16g** *11/02*
U.S. Cl. 52—223L **3 Claims**

A tendon anchorage for use in prestressing concrete members which preferably includes a tubular mounting means mounted to extend through a wedge supporting bore in the anchorage in order to secure the anchorage in fixed spaced relation to a concrete form for casting the anchorage into the concrete member is disclosed. The mounting tube is formed to secure the anchorage from the side thereof remote to the concrete form and urge the anchorage against a spacing means placed between the anchorage and the concrete form. Bearing plates may



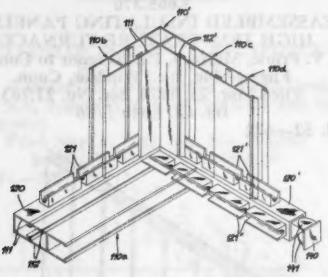
similarly be secured by the mounting means through a tendon receiving opening from the remote side thereof. Anchorage grouting apparatus and tendon containing conduits may be secured to the mounting tube. An anchorage wherein the wedges extend from the remote side of the anchorage and are unsupported and achieve gripping action through cantilever forces from the anchorage is also disclosed.

3,605,362
CONNECTION SYSTEM FOR RELIEVING STRESS IN CONCRETE STRUCTURES
Edward A. Sweeney, Everett, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.
Filed June 10, 1969, Ser. No. 831,846
Int. Cl. E02d *27/38;* **F16j** *11/00;* **G21g** *13/02*
U.S. Cl. 52—224 **1 Claim**



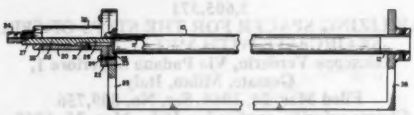
A structural connection assembly of steel reinforcing bars and concrete adapted to relieve shear and bending stresses which are developed at geometric discontinuities in a concrete vessel structure and the method of fabricating this assembly. The wall of the vessel is comprised of a foundation section and an upper wall section with a zone of separation therebetween. The reinforcing bars extend from the foundation section to the upper wall section and transmit all loads through the zone of separation. Alternatively, the vessel dead weight load may be wholly or partly taken by a bearing. Cavities of a designed cross section and length are provided to allow for deflection of the reinforcing steel within this length.

3,605,363
ASSEMBLY OF STRUCTURE ELEMENTS
Martin Bard, 4318 8th Ave., Brooklyn, N.Y. 11232
Filed Mar. 14, 1969, Ser. No. 807,199
Int. Cl. E04b *1/348, 2/32*
U.S. Cl. 52—241 7 Claims



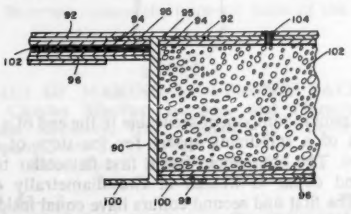
Several profiled members of metal or other resilient material, each with one or more pairs of parallel flanges held together by a transverse web, are interconnectable by tongue-and-groove formations extending along the free edges of their flanges. The interconnected members are locked in position by a bar disposed transversely to these members and provided with tenons inserted endwise into the channel formed between the webs and flanges of adjoining members, thereby preventing their untimely disengagement while reinforcing the structure.

3,605,364
ANTI-SAG DEVICE FOR END SUPPORTED TUBULAR MEMBER
Richard D. Ford, Temple Hills, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed Apr. 4, 1969, Ser. No. 813,448
Int. Cl. E04c *3/10*
U.S. Cl. 52—291 6 Claims



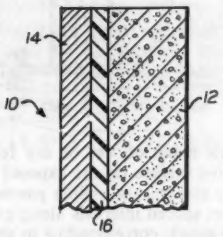
This disclosure is directed to a means for preventing sag in an end supported elongated tube by use of spaced wire guides within the tube and a strong cable or wire which passes through the tube and is tensioned sufficiently to prevent sag.

3,605,365
PLASTIC FOAM BUILDING PANEL
Allan J. Hastings, 2201 Dallas St., Royal Oaks, Mich. 48067
Filed Sept. 8, 1969, Ser. No. 855,808
Int. Cl. E04c *2/10*; E04b *2/56*; B29d *27/00*
U.S. Cl. 52—309 15 Claims



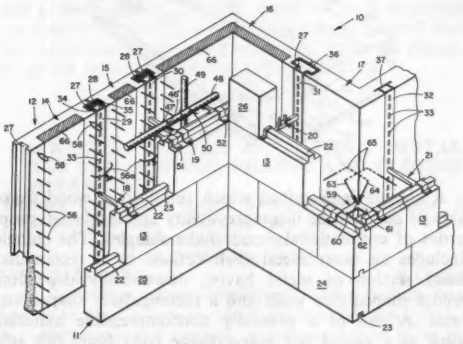
In a manufacturing plant a preformed or prefoamed sheet is formed of heat expandable plastic foam material with at least one face having a pattern of relatively raised and depressed portions forming steam channel and distribution means and with or without a face ply bonded to one face of the sheets; and at a building site the sheet is juxtaposed to planar building forms, or to planar face plies, depending on whether or not the wall is to be laminated, and steam is applied through the channel and distribution means to expand the plastic foam material to fabricate a building wall.

3,605,366
COMPOSITE LAMINATE PANEL CONSTRUCTION
Gerald Zakim, 8 Nottingham Road, Preakness Station 824, Wayne, N.J. 07470
Filed Nov. 28, 1969, Ser. No. 880,845
Int. Cl. E04b *1/16*
U.S. Cl. 52—378 11 Claims



A laminated panel construction having a supporting layer and a facing layer and a continuous quick-cure elastomer therebetween. Panels having connecting anchors secured to the supporting layer and the facing layer and having an intermediate portion in sealed relationship with the interlayer are also disclosed. A process for construction of the panels is also disclosed which includes the step of applying the elastomer in liquid form.

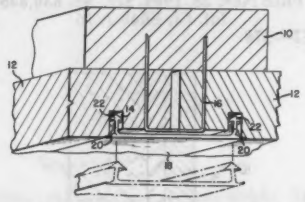
3,605,367
LATERALLY RELATED WALL STRUCTURES WITH TRANSVERSE TIE
Thomas B. Crawley, 7 Deepglade Crescent, Willowdale, Ontario, Canada
Filed May 27, 1969, Ser. No. 828,293
Int. Cl. E04b *2/40, 2/30, 2/32*
U.S. Cl. 52—426 3 Claims



A wall structure having a pair of spaced walls for receiving a structural material such as concrete therebetween has spacer members extending between the walls to maintain the required separation. The structure is designed so that each spacer may be secured to one wall at any of a plurality of positions along a first line and, to the second wall, at any of a plurality of positions along

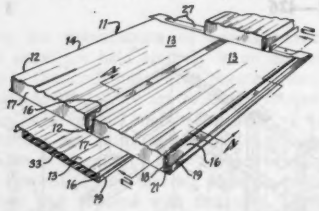
a second line angularly disposed to the first line. In erecting such a structure, each spacer can be disposed at the position where the first and second lines effectively intersect without requiring precise alignment of the two walls.

3,605,368
CEILING SYSTEM WITH MASKING STRIPS AT PANEL JOINTS
Elie G. Lalouche, Redmond, Wash., assignor to Simpson Timber Company, Seattle, Wash.
Filed Sept. 22, 1969, Ser. No. 859,645
Int. Cl. E04c *1/38;* **E04f** *19/06*
U.S. Cl. 52—460 **2 Claims**



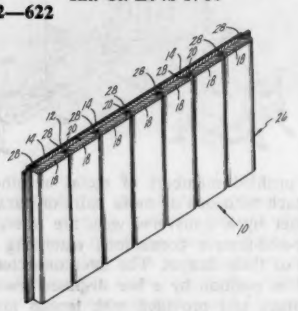
Ceiling panels made of wet or dry felted wood fiber with a decorative surface on the exposed surface thereof are installed by stapling the ceiling panels to ceiling support members at spaced intervals along grooves routed at intervals in the panels corresponding to the spacing of the ceiling support members, and along the lengthwise edges of the panels. To mask the staples, grooves and joints between the panels an elongated resilient plastic strip having protrusions thereon adapted to grip the sides of the grooves are inserted into the groove. The plastic strip lays flush with the exposed face of the ceiling panel giving the overall ceiling an aesthetically appealing appearance.

3,605,369
WOOD SIMULATING SHINGLE
Clifford C. Merrill, Ferndale, Calif. (20541 Williams Highway, Williams, Oreg. 97544), and Carl E. Strombeck, P.O. Box 95, Loleta, Calif. 95551
Filed Mar. 5, 1969, Ser. No. 804,427
Int. Cl. E04d *1/20, 3/362*
U.S. Cl. 52—530 **5 Claims**



A shingle is described which simulates a wood shake shingle and has the incompressibility and insulation properties of conventional wood shake shingles. The shingle includes an outer metal shell defined by a rectangular body section of metal having downwardly depending wedge-shaped side walls and a rectangularly shaped end wall. A pad of a generally noncompressible material, such as a closed cell polyurethane rigid foam fills substantially the full cavity defined by the shell. The pad of material extends between the underneath surface of the body section of the shell and the roof base to which the shingle is secured so as to support the body section and prevent concentrated loads from bending the same. The shingle includes at its sides and ends structure for interlocking the same with similar shingles to provide a shingle roof arrangement. The interlocking structure at the sides of the shingles is designed to permit lateral shifting of the shingle relative to shingles laterally adjacent thereto, and the pad has a configuration permitting such adjustability.

3,605,370
PREASSEMBLED INSULATING PANELS FOR HIGH TEMPERATURE FURNACES
Glen V. Prible, Malvern, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Mar. 23, 1970, Ser. No. 21,703
Int. Cl. E04b *1/80*
U.S. Cl. 52—622 **5 Claims**



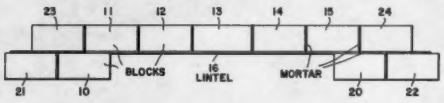
Preassembled insulating panels for high temperature furnaces having a nonexposed anchor for hot side refractory material. At least one layer of refractory block is fixed in rows to a metal backing so as to have transverse spaces between adjacent rows of the block. A high temperature insulating ceramic wool blanket is placed over the rows of refractory block and folded into the transverse spaces therebetween. The anchor mechanism for the ceramic blanket is placed in the folded portions of the blanket so as to be protected from direct furnace exposure.

3,605,371
STABILIZING SPACER FOR THE STEPS OF SPIRAL STAIRCASES WITH METAL NEWELS
Giuseppe Verderio, Via Padana Superiore 1, Gessate, Milan, Italy
Filed Mar. 24, 1969, Ser. No. 809,756
Claims priority, application Italy, Mar. 26, 1968, 14,388/68
Int. Cl. E04f *11/00*
U.S. Cl. 52—720 **1 Claim**

An annular component securable to the end of a tubular element of a stabilizing spacer for the steps of a spiral staircase. The component has a first flat collar to which a second collar is welded at two diametrally opposite spots. The first and second collars have equal inside diameters to allow free passage of a step-supporting newel. The outside diameter of the second collar is slightly

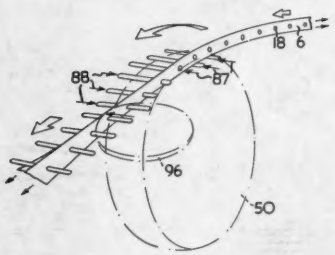
smaller than the inside diameter of the tubular element to permit engagement with the tubular element. The second collar is bent around the diameter extending through the welding spots to progressively diverge from the first collar and insertable the tubular element to center the latter.

3,605,372
METHOD OF MAKING A REINFORCED PLASTIC LINTEL
Arthur H. Wunderlich, Colonia, and Roman Slysh, Scotch Plains, N.J., assignors to Esso Research and Engineering Company
Filed Nov. 8, 1966, Ser. No. 592,861
Int. Cl. E04b *1/16;* **E04c** *2/10*
U.S. Cl. 52—747 **7 Claims**



An improved method of making in a masonry block wall a lintel over an opening wherein a plastic film is positioned across the lintel opening and adhering on said film a thin glue line after which the building blocks are adhered to the film thus forming the lintel.

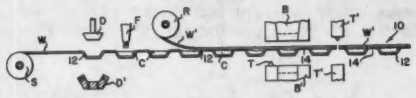
3,605,373
STICK STRIP WINDING MACHINE
Jean Paul Beaudoin, Mount Royal, Quebec, and Hiral Hogue, Ville d'Anjou, Quebec, Canada, Jacques Larocque, deceased, late of Pierrefonds, Quebec, Canada, by Patricia Powers Larocque, executrix, Pierrefonds, Quebec, Canada; said Beaudoin and Hogue assignors to John Lewis, Inc., Montreal, Quebec, Canada
Filed Dec. 9, 1968, Ser. No. 785,854
Int. Cl. B65d *15/04*
U.S. Cl. 53—3 **4 Claims**



A tensioned tape having two corresponding series of circular pre-punched holes and a series of planar elongated articles each having a substantial width in relation to its thickness are provided. The plane of each elongated article is parallel to the axis of the tape so that the tape is flattened against the opposite faces of the articles.

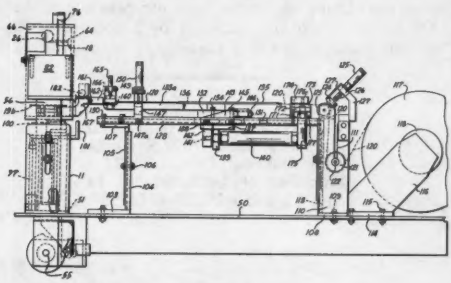
3,605,374
METHOD OF MAKING MULTI-UNIT PACKAGES
David Charles Mueller, Neenah, and Norman John Asman, Appleton, Wis., assignors to American Can Company, New York, N.Y.
Filed Apr. 2, 1969, Ser. No. 812,771
Int. Cl. B65b *43/00*
U.S. Cl. 53—3 **8 Claims**

Multi-unit packaging wherein the individual pocket portions of each package unit are separated from each other while the group of package units is maintained in contiguous relation by a thin cover web overlying and connecting all pockets, the cover web being readily torn to separate individual package units. The multi-unit package is initially formed with the pockets serially con-



nected by weakened flanges which are fractured to separate the pocket portions after filling and closing thereof, and incident to the compact grouping for securing into a convenient merchantable package.

3,605,375
BANDING MACHINE AND METHODS
Richard C. Marshall, Kansas City, Mo., assignor to Automatic Bander Corporation, Kansas City, Mo.
Continuation-in-part of application Ser. No. 613,615, Feb. 2, 1967. This application Apr. 7, 1969, Ser. No. 813,915
Int. Cl. B65b *13/02, 13/20, 27/08*
U.S. Cl. 53—3 **7 Claims**

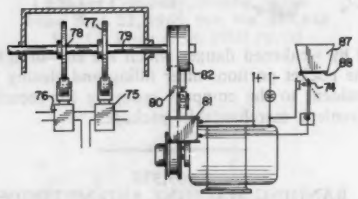


Method and apparatus for banding packets of commercial paper. A heat sealable banding strip is withdrawn from a continuous supply and positioned on a base plate. A stack of commercial paper is placed on the base plate and pressure plates then press the stack. Next, additional banding material is wrapped about the base plate, stack, and pressure plates, and heat sealed on itself to encircle the assembly. Finally, the banding strip is severed from the continuous supply and the pressure plates are released to permit removal of the banded packet.

3,605,376
PACKAGING SYSTEM EMPLOYING METAL TAB BAG OPENING, FILLING AND CLOSING APPARATUS
Thomas E. Piazze, Mount Vernon, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 5, 1970, Ser. No. 520
Int. Cl. B65b *43/36*
U.S. Cl. 53—29 **8 Claims**

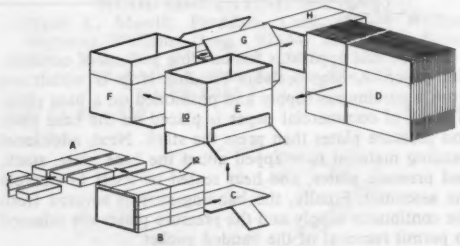
A packaging system employing square bottom bags having tin tie closures in which the bags are stacked in a bag dispensing and opening apparatus which is in the form of a magazine accommodating a stack of the collapsed bags in generally upright position with the bottom edges resting on the top run of a conveyor in the forwardly sloping bottom of the magazine, which conveyor is operated intermittently in response to change in pressure at the front of the stack when the bottom of the foremost bag opens and moves past stop members in the bottom of a discharge opening in the upright, forwardly

inclined front wall of the magazine so as to urge the bags toward the discharge opening, the foremost bag in the stack being held by stop members and co-operating releasable locking devices engaging beneath end portions of the tin tie strip while an air nozzle is actuated to direct a blast of air downwardly along a curved guide plate and into the bag mouth so as to blow open the bag which releases the bottom and permits the bag to swing forwardly to a vertical position for filling, with the tin tie



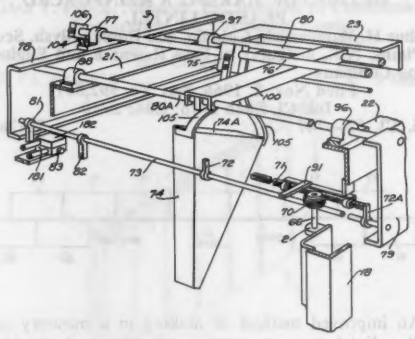
strip serving as a pivot support. A switch which may be actuated by a product feeding and counting or weighing apparatus controls the operation of the air nozzle and a means connected to the tin tie end locking devices for unlocking the same and releasing the bag, permitting it to drop free of the frame onto a conveyor which advances it to a top closing apparatus, with the next bag in the stack being opened up automatically by a succeeding blast of air and swinging to filling position.

3,605,377
CARTON LOADING MACHINE
Herbert J. Sabel, 7074 Sayre Drive, Oakland, Calif. 94611
Filed Feb. 25, 1970, Ser. No. 13,922
Int. Cl. B65b *35/50, 43/18, 57/10*
U.S. Cl. 53—61 **14 Claims**



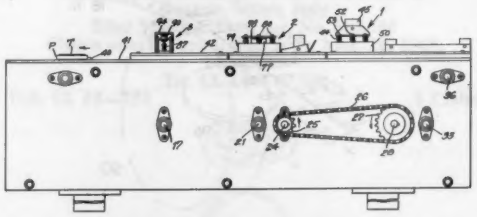
An automatic packaging machine is disclosed for continuously loading products into a shipping carton through its open bottom. In the embodiment described, products are received from a supply source and progressively guided into a single layer and arranged in a predetermined order. As completed, each layer is moved to a stacking station which loads itself to the desired number of layers or tiers. The accumulated products in the completed stack are then moved on to an elevator platform that raises the stack upwardly and into a carton which has previously been opened and positioned above the elevator. With the products held within the open carton, its bottom end flaps are closed around the ends of the elevator platform. The carton is then pushed free from the elevator platform onto an intermediate platform with its bottom end flaps still folded. Thereafter the carton is moved longitudinally to close the bottom side flaps and the top flaps while also applying closure or sealing means such as a glue.

3,605,378
TAPE LOADING APPARATUS
Owen Rodwell Read, 71 Orchard Drive, Cumberland, R.I. 02864
Continuation-in-part of application Ser. No. 809,504, Mar. 24, 1969. This application Mar. 16, 1970, Ser. No. 19,940
Int. Cl. B65b *63/04*
U.S. Cl. 53—116 **7 Claims**



This specification discloses apparatus for loading tape into one or more boxes, simultaneously, through the open top thereof to achieve an orderly arrangement of the stored tape. The apparatus comprises a horizontal platform on which a box or boxes are received, a tape guide chute or chutes fastened to a rod, mechanism for oscillating the rod and chutes laterally above the boxes and independent mechanism for traversing the rod and chutes longitudinally of the boxes.

3,605,379
MACHINE FOR SECURING TAB TO PACKAGE
James Alexander, Belleville, N.J., assignor to Scandia Packaging Machinery Company, North Arlington, N.J.
Filed Apr. 16, 1968, Ser. No. 721,701
Int. Cl. B65b *61/14*
U.S. Cl. 53—134 **10 Claims**

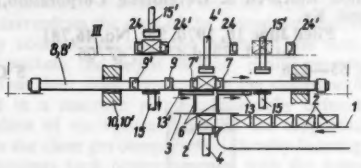


This invention relates to a machine for securing a tab to a package, flattening the projecting tab and punching a hole through the tab. The package is intermittently fed along a table or support to three successive stations where the three operations are carried out.

3,605,380
APPARATUS FOR WRAPPING UP GOODS
Alfred Dille, Hannover-Kleefeld, Germany, assignor to Otto Hansel GmbH, Hannover, Germany
Filed Sept. 9, 1968, Ser. No. 758,230
Claims priority, application Switzerland, Sept. 7, 1967, 12,745/67; Germany, Nov. 2, 1967, P 15 86 117.3
Int. Cl. B65b *11/22, 11/28*
U.S. Cl. 53—202 **29 Claims**

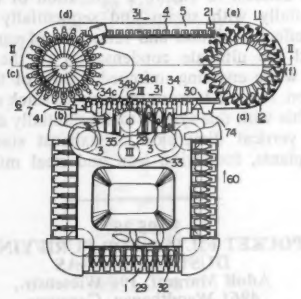
An apparatus for wrapping of goods, particularly of the sweets industry, into a wrapping material blank by use

of a lifting piston which comprises the steps of pushing a piece of goods together with a blank of wrapping material disposed above the piece of goods through a folding shaft, thereby folding the blank around the piece of goods in U-shape, performing the bottom and end face fold of the blank by application of gripping and folding members,



the latter gripping the piece of goods jointly with the blank, shifting partly wrapped pieces of goods after passing through the folding shaft alternately into at least two folding paths formed by cooperating gripping and folding members, and intermittently moving through the latter for a final wrapping.

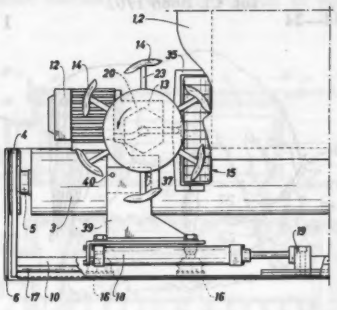
3,605,381
APPARATUS FOR FILLING AND SEALING SYNTHETIC RESIN CONTAINERS
Shinsuke Yoshikawa and Yuji Sawa, Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Jan. 12, 1970, Ser. No. 2,168
Int. Cl. B65b *3/00*; B67c *3/02*
U.S. Cl. 53—266 **4 Claims**



Fluid containers of a flexible synthetic resin are automatically filled and sealed in continuous succession by a filling rotary and a sealing rotary coupled by an endless holder conveyor which is passed around them and supports equally spaced holders for grasping and holding the neck parts of respective containers, the containers being fed to the conveyor by a pan conveyor and inserted into respective holders by pushing members mounted on an endless chain disposed at one part at an oblique angle relative to the holder conveyor to operate the pushing members.

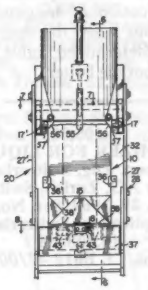
3,605,382
MACHINE FOR WRAPPING ROLLS
Erik Andersson, 666 OO Bengtsfors, Sweden
Filed May 6, 1969, Ser. No. 822,111
Int. Cl. B65b *7/10*
U.S. Cl. 53—380 **3 Claims**

A machine for wrapping rolls of, for example, paper in a wrapper, rotatably supports each roll with portions of the wrapper extending from end of the roll and folding means rotating about an axis at right angles to the axis of the roll engage and fold the wrapper extending portions



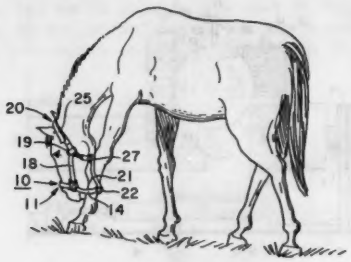
against the end of the roll after which a flattening member flattens said folds.

3,605,383
BAG DISPENSING AND OPENING APPARATUS
Thomas E. Piazze, Mount Vernon, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 5, 1970, Ser. No. 519
Int. Cl. B65b *43/36*
U.S. Cl. 53—385 **12 Claims**



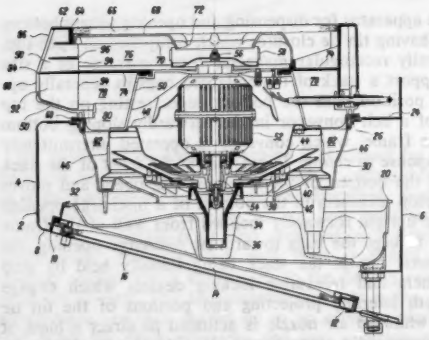
An apparatus for dispensing and opening square bottom bags having tin tie closures which comprises an open top, generally rectangular magazine forming frame of a size to support a stack of the collapsed bags in generally upright position with the bottom edges resting on the top run of a belt conveyor in the forwardly sloping bottom of the frame, which conveyor is operated intermittently in response to change in pressure at the front of the stack when the bottom of the foremost bag opens and moves past stop members in the bottom of a discharge opening in the upright forwardly inclined front wall of the frame so as to urge the bags toward the discharge opening, the foremost bag in the stack being initially held by stop members and releasable locking devices which engage beneath laterally projecting end portions of the tin tie strip while an air nozzle is actuated to direct a blast of air downwardly along a curved guide plate and into the mouth of the bag so as to blow open the bag which releases the bottom and permits the bag to swing forwardly to a vertical position for filling, with the tin tie serving as a pivot support. A foot switch controls the operation of the air nozzle and a means connected to the tin tie end locking devices for unlocking the same and releasing the bag, permitting it to drop free of the frame, whereupon the next bag in the stack is opened up automatically by a succeeding blast of air and swings to position for filling.

3,605,384
BREAKAWAY HALTER
Edo Pacini, 17494 Ehle St., Castro Valley, Calif. 94546
Filed July 17, 1969, Ser. No. 842,630
Int. Cl. B68b *1/02*
U.S. Cl. 54—24 1 Claim



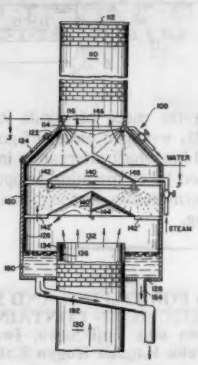
A breakaway halter for a horse to enable the animal to free himself therefrom should the halter become entangled in a fence or tree branch, or should a leg of the animal become caught in the halter in making an effort to free himself from such entanglement. The halter includes both a nose strap and a neck strap respectively encircling the nose and neck of the animal, and the neck strap has free end portions adapted to overlie each other when encirling the animal's neck. These free end portions are equipped with stress-releasable means for detachably interconnecting the same; and such releasable means is generally effective to resist separation of the free end portions upon application of longitudinal tensile forces of ordinary value, but when the magnitude of any such force exceeds a predetermined value, separation occurs to free the animal from the halter.

3,605,385
ATOMIZER FOR LIQUIDS
Hans Rudolf Stoop, Zug, Switzerland, assignor to Defensor AG, Zurich, Switzerland
Filed Sept. 29, 1969, Ser. No. 861,875
Claims priority, application Switzerland, Oct. 3, 1968, 14,808/68
Int. Cl. B01d *47/00*
U.S. Cl. 55—224 6 Claims



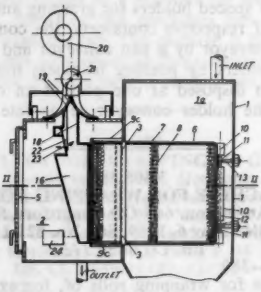
A novel atomizer for liquids is disclosed, the atomizer being of the type wherein a separate primary and secondary air stream is provided, the secondary air stream being utilized as a transportation air stream so as to aid the primary air flow containing the atomized liquid or mist. Both the primary and secondary air streams are discharged into the room approximately horizontally, with the secondary air stream being discharged at a level above the primary air stream. In this fashion, the secondary air stream further functions as a means to protect the ceiling of the room against spray and mist contained in the primary air stream.

3,605,386
FURNACE EXHAUST POLLUTION ELIMINATOR
Jimmy R. Erwin, Catlattsburg, and Edward Ray Lockhart and Robert Lee Justice, Ashland, Ky., assignors to Air Pollution Research & Developing Corporation, West Ashland, Ky.
Filed June 16, 1970, Ser. No. 46,781
Int. Cl. B01d *47/02, 47/06*
U.S. Cl. 55—228 5 Claims



This furnace exhaust pollution eliminator is adapted to integral construction with a chimney stack or to installation between the respective input and exhaust ends thereof. The specific means include plural baffles confining the exhaust to ensure a saturation of the exhaust solids initially with steam and sequentially with cold water to effect oxidation and reduction of certain of the solids and the ultimate condensation of the steam for drainage, while ensuring unimpeded flow of the gases of combustion, less solids from the furnace stack or chimney. It is possible with this system to substantially decrease the common vertical dimension of exhaust stacks serving reaction plants, foundries, iron and steel mills and the like.

3,605,387
POCKET FILTER FOR PURIFYING DUST-LADEN GAS
Adolf Margraf, 196 Wiesenstr., 4961 Wendthagen, Germany
Filed Sept. 29, 1969, Ser. No. 861,814
Claims priority, application Germany, June 10, 1969, P 19 29 312.0
Int. Cl. B01d *46/04*
U.S. Cl. 55—294 9 Claims



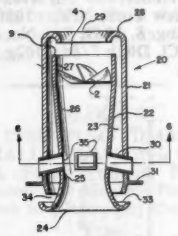
In a pocket filter for purifying dust-laden gas, comprising a filter chamber separated into a dust-laden gas

compartment and a clean gas compartment by a wall with vertically extending slots formed therein in spaced parallel relation, and filter pockets extending through the slots into the dust-laden gas compartment secured to the slotted wall and supported by inner frames including a bridging formed by a mat of spiral springs inserted into the filter pockets and extending beyond the slotted wall into the clean gas compartment, the invention residing in that profile members are secured together with the filter pockets intermediate the slots of the slotted wall extending vertically continuously over the height of the slots and the filter pockets, the height of these profile members being such that their sides remote from the slotted wall are disposed in a common plane substantially coinciding with the plane of the vertical edges of the supporting frames within the clean gas compartment thereby forming individual passages each communicating with the interior of a filter pocket. A known cleansing gas nozzle communicating with a source of pressure gas and having a discharge opening extending over the length of the passages formed by the profiles substantially in the plane of their free sides is movable in lateral direction past the row of filter pockets. Whenever the mouth of the cleansing gas nozzle becomes aligned with a passage communicating with the interior of the respective filter pockets the flow of gas will be reversed thereby removing the dust accumulated at the outside of the filter pocket.

3,605,388
APPARATUS FOR CONTACTING LIQUIDS AND GASES

Frederik J. Zuiderweg and Hendrik J. Scheffer, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed July 19, 1968, Ser. No. 746,065
Claims priority, application Great Britain, Dec. 29, 1967, 59,245/67
Int. Cl. B01d *47/10*
U.S. Cl. 55—236 **1 Claim**



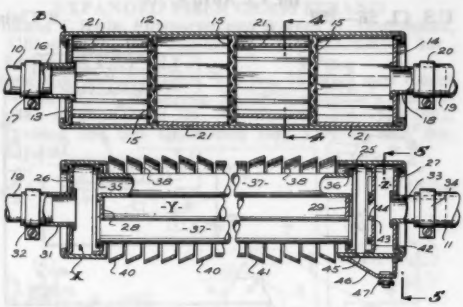
Apparatus for contacting liquids and gases comprising a hollow chamber having a vapor inlet and outlet and a liquid inlet communicating with the interior of the chamber. Rotational means is mounted in the chamber downstream of the vapor inlet for imparting rotary movement to a mixture of liquid and vapor within the apparatus. Constriction means is disposed downstream of the rotational means and upstream of the vapor inlet for constricting the flow through said chamber.

3,605,389
AUTO EXHAUST TREATING MEANS

John Allen Buttler, deceased, late of Los Angeles, Calif., by James W. Allen, administrator, North Hollywood, Calif., assignor to Walhamlin, Inc.

Filed Mar. 24, 1969, Ser. No. 812,554
Int. Cl. F01n *3/02*; **F02b** *75/10*
U.S. Cl. 55—269 **8 Claims**

An auto exhaust treating means for removing unburned hydrocarbons from exhaust gases and prevent their being introduced into the atmosphere, which means collects solid matter carried by exhaust gases and holds it in the presence of high temperature, burning gases for incineration thereof, arrests combustion of gases; effects

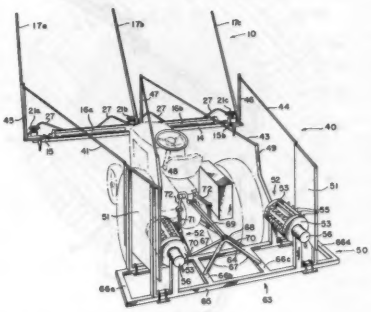


subsequent cooling of gases and condensation and precipitation of certain of the unburned hydrocarbons carried thereby; and separates the condensates and precipitates from the gases and collects them for subsequent disposal.

3,605,390
MACHINE FOR PREPARING HOPS FOR HARVESTING

Amos T. Gamache, 211 S. 24th St., Yakima, Wash. 98902, and Alvin Treneer, 512 Bolin Drive, Toppenish, Wash. 98948

Filed Dec. 5, 1968, Ser. No. 781,558
Int. Cl. A01d *41/08*
U.S. Cl. 56—16.5 **11 Claims**

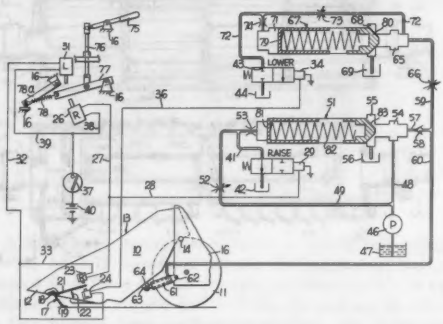


A machine is disclosed for preparing vertically suspended hop vines for harvesting and includes a crossarm assembly attached to a power vehicle. On the crossarm assembly are mounted blades which project into the paths of the hop vines. The blades are spaced a distance apart essentially equal to the row spacing of the hop vines. The blades, as they are advanced through the hop vines sever the interconnecting hop vines and guide the hop vines to cutting zones where rotary cutters sever the hop vines near their base. The base-severed vines are then guided to a stripping zone where the foliage is stripped from the lower ends of the base-severed hop vines by rotary beaters coacting with baffle plates.

3,605,391
HEADER HEIGHT CONTROL

Robert E. Schott, New Berlin, Ind., and Ramkishan Khatti, Milwaukee, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed May 19, 1969, Ser. No. 825,878
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 9 Claims

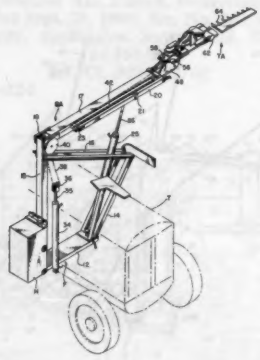


A combined electrical, mechanical and hydraulic mechanism for maintaining the height of a combine harvester header relative to the ground at a constant height and wherein hydraulic means are provided for controlling the acceleration and deceleration of such header as it is being moved upwardly or downwardly in response to a height signal.

3,605,392
TREE TRIMMER

Martin C. Fossum, Yakima, Wash., assignor of fractional part interest to A. Thor Fossum, Yakima, Wash.

Filed Aug. 28, 1969, Ser. No. 853,862
Int. Cl. A01d *55/32*
U.S. Cl. 56—237 7 Claims

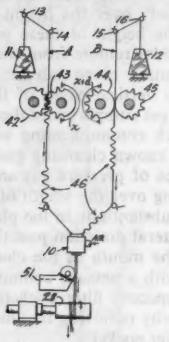


A mobile vehicle is provided with a boom assembly which comprises an upright mast and a telescopically extendable boom pivotably mounted on the mast. A trimmer assembly is mounted for pivotal movement on the outer end of the boom. Hydraulic actuators are provided for extending the boom, pivoting the boom in a vertical plane, and pivoting the trimmer assembly in a vertical plane about the end of the boom. The angular position of the trimmer assembly is related to the extension of the boom. In one embodiment a rotary saw is provided with a first manually adjustable pivotal mounting for rotating the saw about a transverse axis relative to the boom and is provided with a second manually adjustable pivotal mounting for rotating the rotary saw about the longitudinal axis of the boom.

3,605,393
APPARATUS AND METHOD FOR MAKING BULKY YARN

Charles F. Schroeder, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation

Original application Jan. 3, 1967, Ser. No. 606,894, now Patent No. 3,496,714, dated Feb. 24, 1970. Divided and this application June 11, 1969, Ser. No. 832,398
Int. Cl. D02g *1/20*
U.S. Cl. 57—34 7 Claims

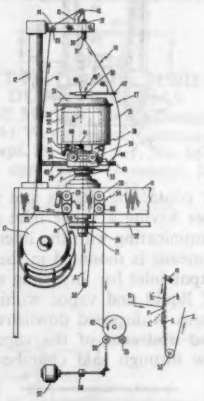


An apparatus for making a bulky textile yarn having at least two groups of filaments combined together with each group alternately forming core and effect filaments in the composite yarn. The apparatus includes means for alternating the feed speed of the filament groups passing to a fluid bulking apparatus which combines the groups in a pattern dependent upon the feed speed relationship, and a means for setting the filament pattern so that the composite yarn retains the filament pattern.

3,605,394
STRAND PLYING METHOD AND APPARATUS

Alfred W. Vibber, 350 5th Ave., Suite 6314, New York, N.Y. 10001

Filed Aug. 8, 1969, Ser. No. 848,491
Int. Cl. D01h *7/86;* D02g *3/00*
U.S. Cl. 57—58.3 14 Claims



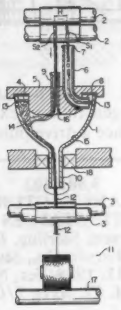
A cord forming method and apparatus, the apparatus including a skip type stranding spindle employing a balloon generating disc and an idle flyer, the idle flyer being so disposed that the portion of the balloon formed between the idle flyer and the balloon apex always rotates in the first quadrant. The balloon is maintained under control by means responsive to changes in tension of the singles strand in the balloon, such means vary the tension and speed at which the plied strand or cord is withdrawn from the plying point of the spindle.

3,605,395

METHOD AND APPARATUS FOR SPINNING OF FIBROUS MATERIALS UTILIZING A ROTARY SPINNING CHAMBER

Takashi Morikawa, Amagasaki-shi, Tatuo Horiuchi, Hirakata-shi, Mitugi Sumi, Fukui-shi, and Tadanori Kurushima, Hirakata-shi, Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka, Japan

Filed June 3, 1968, Ser. No. 733,866
Claims priority, application Japan, June 5, 1967, 42/36,134; Aug. 9, 1967, 42/51,383
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.89 5 Claims



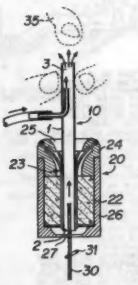
In the spinning method and apparatus wherein a sliver or roving is fed to a rotary spinning chamber to be rendered into a spun yarn by being imparted a draft and twist while passing therethrough, a method and apparatus characterized in that at least two ends of the sliver or roving are fed to the rotary spinning chamber, of which at least one of the sliver or roving is directly conducted to a portion other than the collecting surface of the rotary spinning chamber, that is, a locality close to the twisting point of the yarn bundle which is drawn thereto via the collecting surface, this sliver or roving thus passing through the spinning chamber to be imparted only a twist and draft without being broken, to be then combined with the other sliver or roving which has been delivered via the collecting surface.

3,605,396

DEVICE FOR INSERTING FILAMENT INTO A RADIALLY CLAMPING GRIP

Claude Guignard, Ferney-Voltaire, France, and Jean Chatelaine Pellaton and Maurice Poull, Meyrin, Switzerland, assignors to Electrospin Corporation, Columbus, Ohio

Filed Dec. 2, 1969, Ser. No. 881,357
Claims priority, application Switzerland, Dec. 24, 1968, 19,255/68
Int. Cl. D01h *15/00, 13/04;* D01g *23/08*
U.S. Cl. 57—106 14 Claims



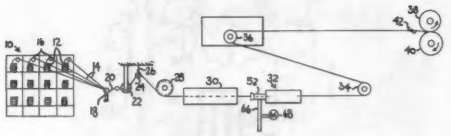
A tool for threading a radially clamping grip with a leader yarn by directing therethrough a fluid flow under pressure. A suction tube inserted into the grip separates the clamping members for removal of broken yarn and the insertion of the leader end of spun yarn.

3,605,397

EXPANDED FIBER GLASS STRAND

Winfield T. Irwin, Pittsburgh, and Warren W. Drummond, Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Application Feb. 15, 1968, Ser. No. 705,666, now Patent No. 3,491,527, dated Jan. 27, 1970, which is a continuation of application Ser. No. 246,889, Dec. 26, 1962. Divided and this application July 1, 1969, Ser. No. 838,119
Int. Cl. D02g *3/18*
U.S. Cl. 57—140G 1 Claim



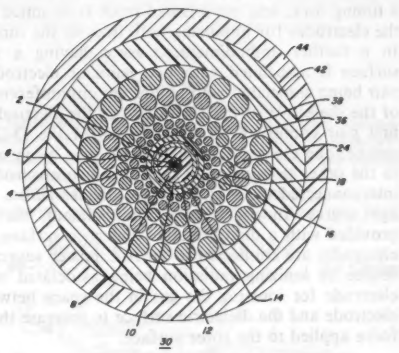
A permanently crimped, multifilament fiber glass product produced by providing a multifilament bundle of untwisted, permanently crimped fiber glass strands and, thereafter, moving said filaments relative to one another.

3,605,398

VARIABLE WEIGHT CABLE

Richard H. Carlson, North Grafton, and Edward M. Felkel, Worcester, Mass., assignors to United States Steel Corporation

Filed Mar. 23, 1970, Ser. No. 21,614
Int. Cl. D07b *1/16*
U.S. Cl. 57—149 7 Claims



A splice free tow cable, built up of layers of armor wire and plastics of different densities surrounding a conductor core, has variable weight and strength sections.

3,605,399

STRINGS

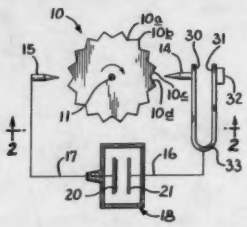
Jacob van Rijswijk, Vijverhofstraat 38–60, Rotterdam 1, Netherlands

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,457
Claims priority, application Great Britain, Apr. 6, 1967, 15,807/67
Int. Cl. D02g *3/36*
U.S. Cl. 57—149 8 Claims

Strings for games racquets are provided which comprise a core consisting of one or more monofilaments of a synthetic long chain polymeric material and one or more

helical wrappings of a synthetic long chain polymeric material, and in which a lubricant is contained in the core or between the wrapping and the core.

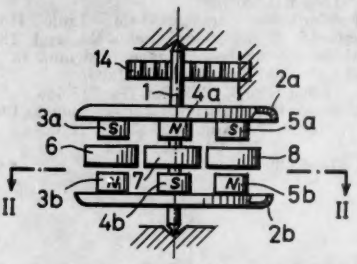
3,605,400
DRIVE ARRANGEMENT FOR TIMEKEEPING SYSTEM
Frank W. Emerson, Peterborough, Ontario, Canada, assignor to General Time Corporation
Filed June 3, 1969, Ser. No. 830,063
Int. Cl. G04c 3/00
U.S. Cl. 58—23 **5 Claims**



A drive arrangement for a timekeeping system comprising an electrostatic motor including a rotor having a dielectric surface and a pair of electrodes operatively associated with the rotor for driving the rotor in response to a D-C potential applied across the electrodes. In one embodiment, one of the electrodes is mounted on one of the tines of a tuning fork, and the dielectric rotor surface is serrated for impulsing the tuning fork to vibrate the same while synchronizing the speed of the rotor with the natural frequency of the tuning fork. In another embodiment, both electrodes are mounted on the two tines of a tuning fork, and the serrated rotor is mounted between the electrodes for impulsing both tines of the tuning fork. In a further embodiment, a rotor having a dielectric surface is associated with two pairs of electrodes, each pair being associated with a different circumferential band of the dielectric surface, with one of the electrodes in the first pair connected to one terminal of the D-C voltage source, one electrode in the second pair being connected to the other terminal, and the other two electrodes being interconnected to form a voltage divider across the voltage source. In still another embodiment, the rotor is provided with a discontinuous dielectric surface, and the electrodes are connected to an A-C power source, with a source of ionizing radiation being associated with each electrode for ionizing the gas in the space between each electrode and the dielectric surface to increase the driving force applied to the rotor surface.

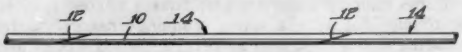
3,605,401
ELECTRONICALLY POWERED CLOCK
Robert Walter Reich, Via Noseda 8, CH-6977 Ruvigliana, Switzerland
Filed Sept. 8, 1969, Ser. No. 855,886
Claims priority, application Switzerland, Sept. 15, 1968, 13,931/68
Int. Cl. G04c 3/04
U.S. Cl. 58—28A **4 Claims**

An electronically powered clock having three magnet means concentrically fixed to a balance wheel and three coils mounted respectively coaxially with the magnet means when said balance wheel is in its zero position. The series-connected outside coils serving as exciter coils for a transistor switching arrangement, the inside coil serving as drive coil for the balance wheel, and the magnet means have such dimensions and such positions with respect to each other that every magnet means coming



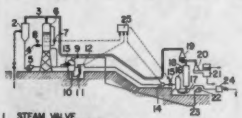
away from one coil and simultaneously approaching neighboring coil will generate an excitation pulse and at the same time experience a drive pulse.

3,605,402
METHOD OF MANUFACTURE OF CURVED TIP STAPLES
Charles O. Larson, Sterling, Ill., assignor to Chas. O. Larson Co., Sterling, Ill.
Filed Dec. 11, 1968, Ser. No. 782,940
Int. Cl. B21g 7/02
U.S. Cl. 59—77 **7 Claims**



In accordance with the present disclosure an elongated piece of wire, of appropriate gauge, is severed diagonally at predetermined spaced points. Each wire length thus formed is then bent into staple form whereby to provide a staple the tines of which taper in opposite direction. The staple tines are then reshaped into symmetrical form, by suitably shaped dies; and in connection with this reshaping operation a predetermined curved shape may be imparted to the tine ends; whereby to provide a staple structure having similarly formed symmetrical tines, the ends of which have a predetermined curved smooth shaping. Barbs or the like may also be simultaneously formed on the staple tines.

3,605,403
TRANSPORTING MEANS AND EQUIPMENT FOR JET ENERGY OF GEOTHERMAL POWER PLANT
Kentaro Aikawa and Mamoru Tahara, Nagasaki-shi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 24, 1969, Ser. No. 860,476
Int. Cl. F03g 7/04
U.S. Cl. 60—26 **2 Claims**

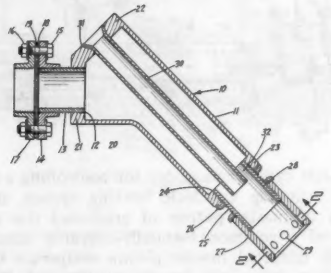


1 STEAM VALVE
2 STEAM SEPARATOR
3 PRIMARY STEAM TRANSPORTING PIPE
4 HOT WATER TRANSPORTING PIPE
5 HOT WATER PUMP
6 HOT WATER HEAD TANK
7 LEVEL GAUGE
8 ELECTRIC OPEN BLOW OFF VALVE
9 TEMPERING WATER SPRAY TANK
10 STRAINER
11 SPRAY PUMP
12 FLOW METER
13 HIGH LEVEL DISCHAGE VALVE
14 FLOW METER
15 ELECTRICAL OPEN CONTROLLER
16 HOT WATER FLUSHER
17 SECONDARY STEAM PIPE
18 CLEANER
19 HIGH PRESSURE TURBINE
20 LOW PRESSURE TURBINE
21 CONDENSER
22 TEMPERING WATER PUMP
23 TEMPERING WATER PIPE
24 WATER DISCHARGE TANK
25 COMPUTING CONTROLLER

In a geothermal power plant which comprises a hot water type geothermal power plant, a mixed fluid of

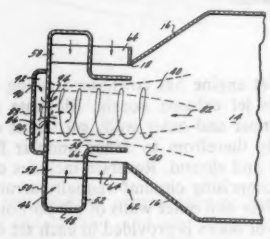
steam and hot water emerging from the bore of a steam well is transported directly to the power plant by means of steam-water mixed fluid carrying pipe lines. The steam-water mixture is separated by a steam separator into high pressure primary steam and hot water at the power station with the former steam being supplied to the primary steam inlet of a mixed pressure turbine, and the hot water being used for production of low pressure secondary steam by a hot water flasher which is then supplied to the secondary steam inlet of the same turbine for generating electric power.

3,605,404
POLLUTION AND NOISE REDUCING MUFFLER
Gust H. Bjork, 2601 Parkview Blvd., Robbinsdale, Minn. 55422
Filed Sept. 29, 1969, Ser. No. 861,677
Int. Cl. F01n *3/10*
U.S. Cl. 60—30 **3 Claims**



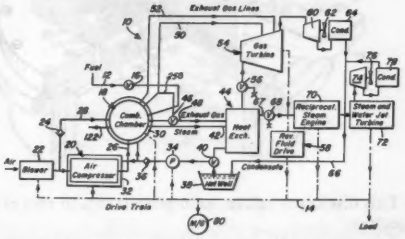
A pollution and noise reducing muffler for internal combustion engines having a hollow tubular body having an exhaust gas inlet into one end and discharge from the other. The inlet end of the tubular body is preferably disposed with its axis at an obtuse angle relative to the longitudinal axis of the muffler and is desirably spanned with foraminous material, such as metal screening. The downstream end of the muffler body functions as an aspirator to draw air through the body to preheat the air before admixture with the exhaust fumes adjacent the discharge end of the muffler. The muffler reduces pollution by promoting further combustion of combustible constituents of the exhaust gases. For maximum noise reduction the muffler body is of rectangular cross-section.

3,605,405
CARBON ELIMINATION AND COOLING IMPROVEMENT TO SCROLL TYPE COMBUSTORS
Thomas L. Du Bell and Barry Weinstein, Cincinnati, Ohio, assignors to General Electric Company
Filed Apr. 9, 1970, Ser. No. 27,023
Int. Cl. F02g *3/04;* **F23m** *9/02*
U.S. Cl. 60—39.65 **11 Claims**



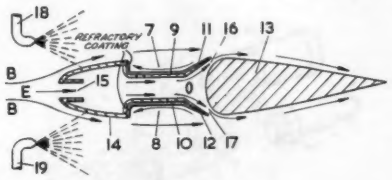
An improvement for apparatus of the type adapted to premix air and fuel or carburet air prior to introduction thereof as a vortical flow into a primary zone of a combustor; the improvement comprises a purge air opening positioned within an upstream wall of a spin chamber and covered by a cap having a plurality of small openings located therein. Purge air flows from the compressor through the small openings into a chamber formed by the cap and thereafter into the spin chamber in such a manner as to prevent impingement of high temperature gases on the upstream wall of the spin chamber without detrimentally affecting generation of the primary vortical flow.

3,605,406
COMBINED GAS AND STEAM POWER PLANT
Raymond L. Woolley, 466 Magnolia Ave., Yuma, Ariz. 85364
Filed June 27, 1969, Ser. No. 837,283
Int. Cl. F02c *1/04, 5/08, 5/12*
U.S. Cl. 60—39.18B **15 Claims**



A combustion fuel type of gas generator sequentially supplies hot, pressurized gases to various stages of a gas turbine through separate flow paths, one of which passes in heat exchange relation to water stored in a heat exchanger. The water is circulated by a turbine driven pump through cooling jackets surrounding the gas generator and a reciprocating compressor supplying pressurized air thereto. Superheated steam from the heat exchanger is conducted in series through a reciprocating steam engine and a reversible steam and water jet turbine to augment the power output of the gas turbine.

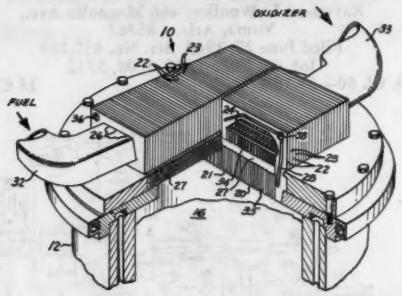
3,605,407
COMBUSTION DEVICES
William Dean Bryce, Farnham, Surrey, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed June 4, 1969, Ser. No. 830,471
Claims priority, application Great Britain, June 10, 1968, 27,395/68
Int. Cl. F23r *1/04;* **F02k** *3/10*
U.S. Cl. 60—39.72 **14 Claims**



The vane of aerofoil section has recesses of generally elliptical shape in its side surfaces. Separation of flow round the vane occurs at the resultant discontinuities and causes recirculation within the recesses, the length of which ensures reduction in velocity compared with free stream flow to allow adequate mixing between unburnt fuel/air mixture and combustion gases. In one arrangement, an inlet is provided in the leading edge of the vane for gas which is discharged from slots positioned rearwardly of the recesses as a cooling film over the down-

stream surfaces of the vane. The surfaces of the recesses may be of ceramic (e.g., silicon nitride) or other refractory material.

3,605,408
COMBUSTION STABILIZED INJECTOR
Charles B. McGough, Fair Oaks, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Mar. 11, 1968, Ser. No. 712,124
Int. Cl. F02g 1/00
U.S. Cl. 60—39.74 18 Claims

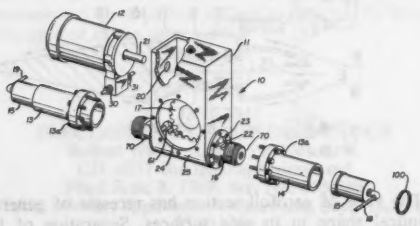


This disclosure relates to improvements in rocket engine injectors.

According to the present disclosure, a rocket engine injector is constructed from a plurality of discrete thin wafers, each having planar surfaces and edge surfaces. A controlled pattern of flow passages is formed in one planar surface of each wafer, each flow passage terminating at an edge surface of the wafer. The wafers are joined together in a stack and the passage terminating edge surfaces form the injector face of the injector. The flow passages are adapted to pass liquid propellant therethrough. To reduce high frequency combustion instability, short baffles or combustion stabilizers are provided as an integral part of the injector face.

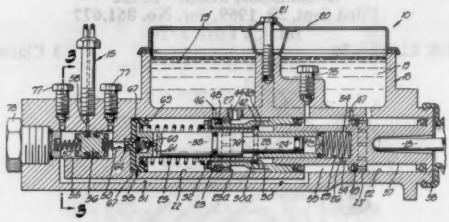
According to one form of the invention, the liquid propellant is delivered to the injector face in such a manner that the fuel flows through passages on certain wafers and the oxidizer flows through passages on other wafers.

3,605,409
HYDRAULIC ACTUATOR
William E. Heese and Kenneth H. Meyer, Akron, Ohio, assignors to Hydra-Power, Inc., Wadsworth, Ohio
Filed Apr. 1, 1969, Ser. No. 812,176
Int. Cl. F15b 15/18
U.S. Cl. 60—52R 6 Claims



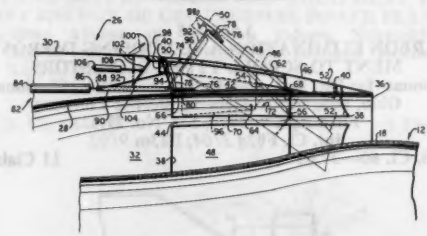
A hydraulic rotary actuator that is provided with integral relief valves in the pistons for protective purposes. The actuator also has a self-contained, hydraulic system that features an enlarged gear chamber that serves both as a mounting base for a pump or power source and as a sump or reservoir for the hydraulic component that, in turn, actuates the actuator. A further characteristic of the hydraulic actuator is the optional provision of a shock absorbing component adapted to cushion the actuated piston toward the end of its power stroke. Also, the rack supporting means are interconnected to the main housing so as to, at all times, provide improved support.

3,605,410
FAIL-SAFE VEHICLE BRAKING SYSTEM WITH INDEPENDENT FRONT AND REAR SUB-ASSEMBLIES
David R. Herriott, 1403 Verdugo Blvd., La Canada, Calif. 91011
Filed June 16, 1969, Ser. No. 833,361
Int. Cl. F15b 7/00
U.S. Cl. 60—54.5E 43 Claims



A master cylinder assembly for controlling a hydraulic system, including a vehicle braking system, utilizing a plurality of master pistons of graduated size under the control of a common manually-operated actuator. The normally retracted master pistons cooperate when first actuated to charge the system quickly with fluid under low pressure, following which the larger piston is deactivated as the load is assumed by a smaller one of the pistons effective to continue pressurization of the fluid at a substantially higher ratio of applied force to the output hydraulic pressure.

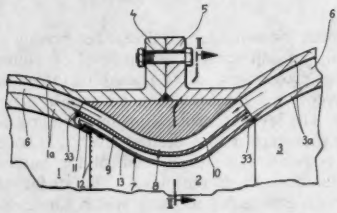
3,605,411
THRUST REVERSING APPARATUS
Richard L. Maison and George E. Medawar, San Diego, Calif., assignors to Rohr Corporation, Chula Vista, Calif.
Filed July 1, 1970, Ser. No. 51,587
Int. Cl. F02k 3/02
U.S. Cl. 60—226 15 Claims



Front fan jet engine has cowl surrounding engine and terminating in jet exhaust nozzle. Elongate streamlined shroud with inner and outer walls surrounds cowl and is spaced radially therefrom to define annular fan air duct between cowl and shroud. Reverser includes outflow passage means comprising circumferentially arranged sets of openings in inner and outer walls of aft portion of shroud. A set of control doors is provided in each set of openings. Each door set includes an inner and an outer door swingable from stowed position closing openings in inner and outer shroud wall and conforming to shroud walls, to deployed, open position diverging forward from longitudinal axis of shroud with forward ends extending into free

stream air, and aft ends of outer doors in blocking contact with engine cowl and each other, thereby blocking rearward flow of fan air and redirecting it outward and forward through passage means to produce reverse thrust. Forward ends of doors of each set approach each other during deployment to provide thinner overall leading edge and increase effective angle of divergence. Spoiler across leading edge of outer door opening swings open to prevent reingestion of reverser gases.

3,605,412
FLUID COOLED THRUST NOZZLE FOR A ROCKET
Karl Stockel, Ottobrunn, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, near Munich, Germany
Filed July 9, 1968, Ser. No. 743,473
Int. Cl. F02k *11/02*
U.S. Cl. 60—260 **5 Claims**

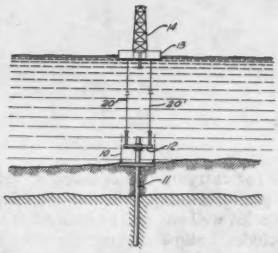


A fluid cooled combustion chamber for a rocket engine is composed of walls forming a longitudinally extending convergent-divergent thrust nozzle having a neck portion at its narrowest section. A radially inner row and a radially outer row of cooling ducts encircle the interior surface of the thrust nozzle at its neck portion with the ducts extending longitudinally into the convergent and divergent portions. The outlet end of the inner row of cooling ducts may be arranged to direct coolant fluid into the thrust nozzle with means providing a twist to the fluid as it enters the nozzle.

3,605,413
RISER WITH A RIGIDITY VARYING LOWER PORTION
George W. Morgan, Anaheim, Calif., assignor to North American Rockwell Corporation
Filed Oct. 24, 1969, Ser. No. 869,313
Int. Cl. E21b *17/00*
U.S. Cl. 61—46 **13 Claims**

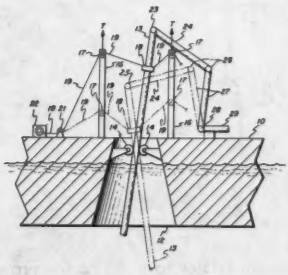
A riser, arranged for communication between a structure at the ocean floor and equipment on the surface where the water depth may be, for example, more than 600 feet, has a lower portion with a rigidity or stiffness sufficient to withstand the worst condition bending moment applied thereto. The stiffness of the upper portion is determined by the design requirements for efficient and economical piping and communication between the ocean floor and the ocean surface. In addition, the section modulus of the lower portion decreases at stations disposed further from the ocean bottom and where the upper and lower portions join the section modulus are substantially the same.

3,605,414
SUBMERGED WELL HEAD PLATFORM
Joseph W. Westmoreland, Jr., Houston, Tex. (% Texaco, Inc., P.O. Box 430, Bellaire, Tex. 77401)
Filed Nov. 27, 1968, Ser. No. 779,412
Int. Cl. E02d *27/52;* **E21b** *15/02*
U.S. Cl. 61—46 **4 Claims**



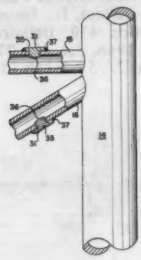
The invention relates to an offshore platform adapted to be submerged and positioned on the floor of a body of water whereby to support an under water well head or similar equipment a predetermined distance above the floor. The platform is particularly adapted for use in a substratum characterized by an unconsolidated or muddy composition which would ordinarily be inadequate to stably support the well head as well as drilling casing and the like. A primary support factor is contributed by a foundation pad connected to, and depending from the conductor pipe, which pad is supported at the ocean floor thereby establishing a firm housing for the conductor pipe.

3,605,415
UNDERWATER RISER SUPPORT STRUCTURE
John W. Mohlman, Tarzana, Calif., assignor to North American Rockwell Corporation
Filed June 30, 1969, Ser. No. 837,503
Int. Cl. E21b *17/00*
U.S. Cl. 61—46 **7 Claims**



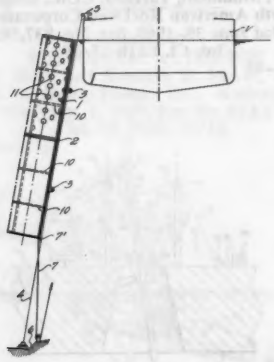
A ship mounted support for an underwater riser is described having a plurality of towers surrounding the upper end of the riser and connected thereto by constant tension winches. Cables from the winches pass over traveling idler pulleys which are urged upwardly on the towers to assist in maintaining a substantially constant upwardly directed force on the riser.

3,605,416
OFFSHORE PLATFORM WITH SACRIFICIAL PLUG MEANS
James W. Kubasta, Metairie, La., assignor to Shell Oil Company, New York, N.Y.
Filed Oct. 20, 1969, Ser. No. 867,522
Int. Cl. E02b 17/00
U.S. Cl. 61—46.5 5 Claims



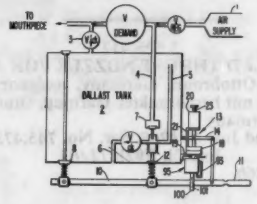
Apparatus for carrying out operations with respect to an offshore platform adapted to be coated or launched over a preselected well site and positioned at said site. The platform includes hollow bracing elements for stabilizing legs on the platform. Sacrificial plugs are provided in operative association with the bracing elements to permit the entry of sea water into the interiors thereof after installation of the platform to eliminate collapse stresses.

3,605,417
DEVICE FOR PROTECTING DIVERS FROM STRONG UNDERWATER CURRENTS
Marcelo Edmundo Wolf, 20 de Junio 1795, Bella Vista, Argentina
Filed June 3, 1969, Ser. No. 829,967
Claims priority, application Argentina, June 4, 1968, 214,537
Int. Cl. B63c 11/00
U.S. Cl. 61—69 15 Claims



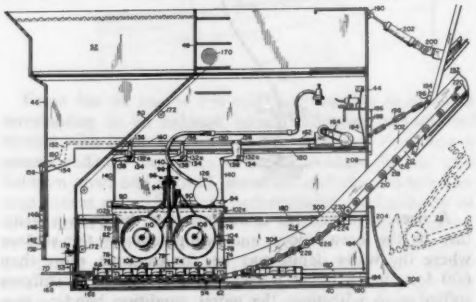
The invention relates to a device for protecting divers against the influence of underwater currents, the device comprising at least one substantially tubular member engaging a cable which is firmly connectable at the bottom of the body of water and to relatively stationary point adjacent the water surface, the tubular member being dimensioned to permit the movement therethrough of a diver and being at least partly perforate to permit the passage of water transversely therethrough.

3,605,418
DEPTH CONTROL AND AUTOMATIC SURFACING DEVICE ACTUATED BY AIR DEPLETION IN AIR SUPPLY TANKS
Samuel Levine, Washington, D.C., assignor of fractional part interest to Abraham A. Saffitz, Arlington, Va.
Filed July 30, 1969, Ser. No. 846,183
Int. Cl. B63c 11/22, 11/30
U.S. Cl. 61—69R 13 Claims



Equipment for swimmers or divers comprising a control to maintain an adjustable constant level of submergence, and further providing a safety feature of forced surfacing of the diver when the breathing air supply gets dangerously low. The level control comprises a ballast tank with means to submerge it to a desired level, and water-depth pressure responsive means to control the ballast in the tank to maintain it at that level. The surfacing means comprises an emergency air tank which carries air under full working pressure and a valve connecting it to the ballast tank. The valve is responsive to the main air supply tank pressure, and when such pressure gets dangerously low, the valve is shifted to a position wherein the emergency air tank is connected to the ballast tank to force the water ballast therefrom and cause surfacing. In another embodiment, a biased piston is latched at an end of a cylindrical portion of the ballast tank. The latching means is responsive to the air pressure of the air supply tank. When the pressure gets dangerously low, the latch means releases the piston which moves under its biasing force to sweep sufficient water from the ballast tank to cause surfacing. The above surfacing means further incorporates timer means to initiate automatic surfacing operation after a selected period of submergence. Alarm means are also provided to indicate the approach of air pressure conditions which initiates surfacing.

3,605,419
METHOD AND APPARATUS FOR LAYING PIPE
Marvin E. Wells, Caldwell, Idaho, assignor to J. A. Terteling & Sons, Inc., Boise, Idaho
Filed May 9, 1968, Ser. No. 727,979
Int. Cl. E02f 5/10, 5/22
U.S. Cl. 61—72.5 32 Claims



An apparatus for installing a subterranean pipeline in an elongated earthen trench. The apparatus includes a

mobile housing operable to be moved along and within the trench. Structure is provided for guiding individual sections of pipe into longitudinal alignment with the pipeline and mechanism is provided for shifting the sections into abutment with the pipeline and for maintaining the pipeline in compression to prevent the individual sections from moving substantially after they are emplaced. The structure and the mechanism are mounted for rectilinear vertical movement within the housing so that the grade of the pipeline may be closely controlled irrespective of the grade of the bottom of the trench. Also included is means for preventing development of suction between the housing and the trench when the latter is moist.

3,605,420
PIPING

John F. Booth, Peter J. Hinchliff, and Walerian Miszka, Stocksbridge, Sheffield, England, assignors to The Hepworth Iron Company Limited

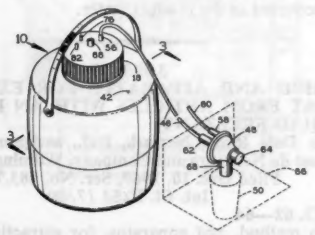
Filed July 14, 1970, Ser. No. 54,697
Claims priority, application Great Britain, Aug. 5, 1969, 39,261/69; Oct. 20, 1969, 51,282/69; May 22, 1970, 24,860/70
Int. Cl. F16l *1/00*
U.S. Cl. 61—72.7 **8 Claims**

Piping is mole-ploughed into the ground by inserting into a length of piping, in particular clayware pipe-lengths abutting end-to-end and preferably connected by slightly resilient plastics sleeves, an inflatable bag which is expanded into gripping contact along the length of the piping, to enable the pull to mole-plough the piping into the ground to be distributed along the length of the piping, and the bag may be reinforced so as to take the pull from the mole-plough or it may be inserted along with a wire to be connected to the mole-plough, with the wire inside or, advantageously, outside the bag.

3,605,421
COOLER

Earnest H. Patrick, 1301 SW. 56th Ave., Fort Lauderdale, Fla. 33314

Filed Feb. 16, 1970, Ser. No. 11,550
Int. Cl. F25b *19/00*
U.S. Cl. 62—7 **19 Claims**

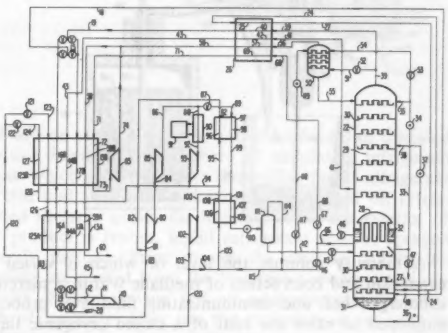


A cooler in which fluid may be cooled, and from which fluid may be dispensed by operation of a dispenser associated with the fuel intake of a gasoline engine in a car, truck, boat or other vehicle. The cooler includes a gasoline vaporizer in a container having a partition, preferably a cup, at least partly enclosing the vaporizer. The vaporizer includes a first tube and a second tube, preferably coiled, with the second tube being located inside the first tube. Preferably, there are: (1) a fluid inlet leading from the container into the partitioning cup, (2) a gasoline inlet leading into the second tube, (3) an air inlet leading into the first tube to supply air to an area therein where gasoline is vaporized, (4) an exhaust outlet for the first tube to draw a gasoline-air mixture through the first tube over the second tube for cooling purposes, and (5) a fluid outlet for suppling cooled fluid from the cup to the dispenser. Thus, fluid may be stored in the container, cooled in the partitioning cup or shell, and dispensed from the shell.

3,605,422
LOW TEMPERATURE PROCESS FOR THE SEPARATION OF GASEOUS MIXTURES

John A. Pryor, Emmaus, and Howard C. Rowles, Center Valley, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 28, 1968, Ser. No. 708,866
Int. Cl. F25j *3/04, 5/00*
U.S. Cl. 62—13 **12 Claims**

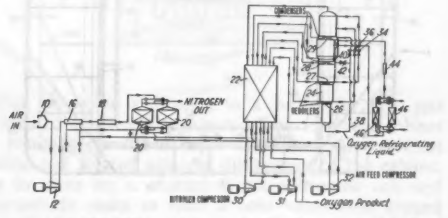


Process for the separation of a gas mixture under low pressure into components by a low temperature fractionating operation including an integrated refrigeration system which increases the liquid producing capabilities of the process for producing relatively large quantities of high purity products in liquid phase without decreasing efficiency of the fractionating operation and without sacrificing purity or yield of desired products.

3,605,423
AIR RECTIFICATION WITH MULTIPLE REBOILERS AND CONDENSERS

Roman Stoklosinski, 1 Lyncroft Gardens, London, W. 13, England

Filed May 28, 1968, Ser. No. 732,670
Claims priority, application Great Britain, June 1, 1967, 25,441/67
Int. Cl. F25j *3/00, 3/02, 3/04*
U.S. Cl. 62—28 **8 Claims**



This invenion relates to a method of fractional distillation in which a feed, preferably air, is introduced into a distillation column having distributed up its height a

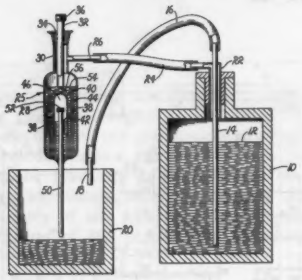
number of reboilers and condensers which are arranged so as to work the column approximately reversibly and obtain a liquid bottom fraction and a top gaseous fraction. At least a part of the gaseous top fraction and at least a part of the feed are used as the heating medium in reboilers, and at least part of the liquid bottom fraction is used as the cooling medium in at least one condenser positioned above the highest reboiler.

3,605,424

VALVING DEVICE FOR AUTOMATIC REFILLING IN CRYOGENIC LIQUID SYSTEMS

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Joe Liberotti, La Crescenta, Calif.

Filed Mar. 19, 1970, Ser. No. 20,960
Int. Cl. F17c 7/02
U.S. Cl. 62—51 **8 Claims**



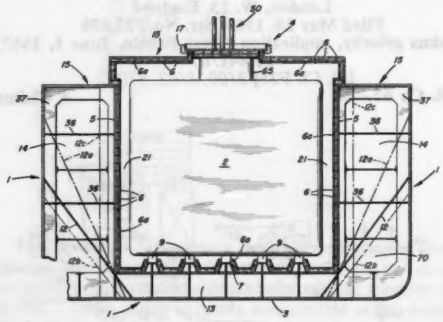
A mercury column, the level of which is varied by expansion and contraction of methane within a mercury-submerged bell and communicating fluid-level probe, is employed to valve the vent of a closed cryogenic liquid supply vessel and cause cryogenic liquid to be displaced therefrom into a cryogenic liquid consumption device.

3,605,425

SHIP SYSTEM FOR THE TRANSPORTATION OF HIGHLY TOXIC CARGOES

Joseph J. Cuneo, Scarsdale, Norman K. Basile, Hauppauge, George R. Knight, Port Washington, and Peter A. Lalangas, Riverdale, N.Y., assignors to John J. McMullen Associates, Inc., New York, N.Y.

Filed Feb. 7, 1969, Ser. No. 806,335
Int. Cl. B63j 2/14; F17c 13/00
U.S. Cl. 62—54 **19 Claims**



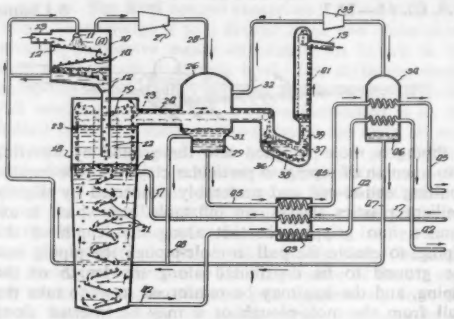
A ship system for transportation of highly toxic cargoes having liquid densities greater than water and gas densities greater than air, such as chlorine. The ship system combines a series of unique features to maximize safety of both human and aquatic life. The ship system consists of a series of cargo tanks arranged longitudinally along the centerline of the ship, each cargo tank isolated from the remainder of the ship by means of a secondary barrier space formed by insulated longitudinal and transverse bulkheads, inner bottom and upper deck. The system provides extensive unique collision protection features to minimize the probability of cargo liquid and/or gas release to the atmosphere, which may be caused by grounding or collision with another ship. Further, the system eliminates the need for handling cargo gas during transit, which also adds to personnel safety.

3,605,426

DESALINATION PROCESS BY CONTROLLED FREEZING

Bei T. Chao, 704 Brighton Drive, and Edward F. Janzow, 1108 N. Lincoln, both of Urbana, Ill. 61801

Filed Nov. 27, 1968, Ser. No. 779,430
Int. Cl. B01d 9/04
U.S. Cl. 62—58 **8 Claims**



A process for recovery of fresh water from brine by formation of ice on the surface of chilled hollow pellets containing a liquid which is at least partially frozen and melts at a temperature below the freezing point of water. The heat of fusion of the frozen liquid absorbs the heat of crystallization evolved in the formation of said ice and provides the pellets with high effective heat capacity and high thermal efficiency. After separation of the ice covered pellets from the brine, the ice is melted and recovered as the product water.

3,605,427

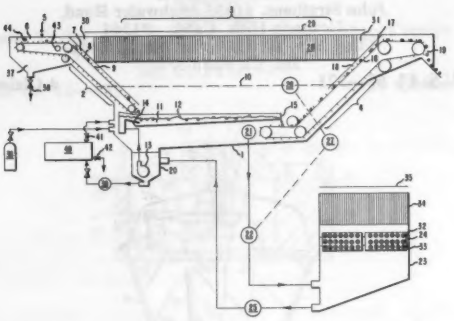
METHOD AND APPARATUS FOR EXTRACTING HEAT FROM ARTICLES WITH AN EBULLIENT LIQUID FREEZANT

Dennis Dale Rudy, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1969, Ser. No. 883,789
Int. Cl. F25d 17/00
U.S. Cl. 62—64 **21 Claims**

In a method, and apparatus, for extracting heat from articles, as in the freezing of food, which method comprises directly contacting the articles with an ebullient liquid freezant in an open vessel without significant loss of freezant vapor to the atmosphere, which method further comprises maintaining by means of a vapor condenser a non-condensable gas-freezant vapor interface within the vessel below the level of all paths to the outside atmosphere and above the level at which the articles come in direct contact with the liquid freezant, and introducing the articles into and removing the articles from

the vessel without substantially disturbing the non-condensable gas such as air above the interface or introducing essentially any non-condensable gas below the interface, the improvement which comprises positioning said vapor condenser in an open housing remote from the



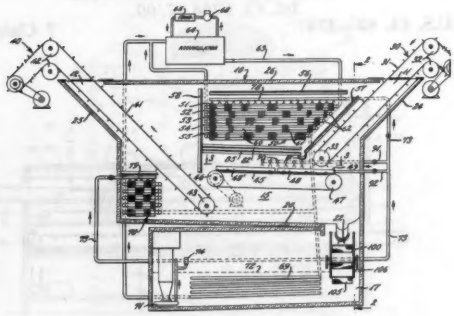
vessel, conducting freezant vapor through a suitable conducting means from the vessel to the housing, maintaining a non-condensable gas-freezant vapor interface in the housing, and returning condensed freezant through a suitable conducting means to the vessel.

3,605,428

PRODUCT FREEZING WITH VAPOR CONDENSATION

Malcolm C. Smith, Hagerstown, Md., and Milton W. Garland, Waynesboro, and Hollis C. Grubb, Chambersburg, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Mar. 5, 1970, Ser. No. 16,833
Int. Cl. F25d *17/00*
U.S. Cl. 62—64 **16 Claims**



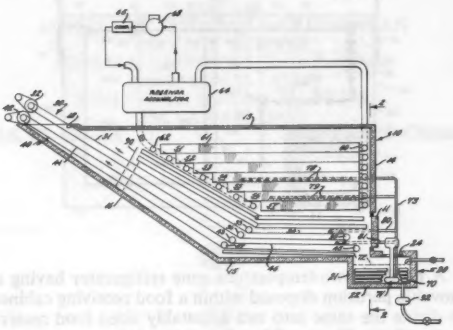
Food or other product is introduced into a housing unsealed at the top in which the atmosphere is maintained at all times during product freezing at a temperature lower than the saturation temperature of the freezing refrigerant at atmospheric pressure. The temperature is maintained by constantly circulating the freezing refrigerant over a low temperature heat exchanger. The product may be sprayed and immersed in the freezing refrigerant whose supply is constantly circulated through a separator for removing product particles, ice and other foreign matter.

3,605,429

DIRECT REFRIGERANT FREEZING

Malcolm Clinton Smith, Hagerstown, Md., and Milton W. Garland, Waynesboro, and Hollis Charles Grubb, Chambersburg, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Nov. 4, 1969, Ser. No. 873,877
Int. Cl. F25d *17/02*
U.S. Cl. 62—64 **6 Claims**



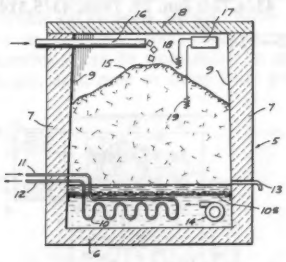
Food or other product is introduced into an unsealed housing having an atmosphere of circulating refrigerant vapor which rises through a descending liquid refrigerant curtain and which is continuously condensed on refrigerated surfaces within the housing. After the exterior of the product is frozen, liquid refrigerant may be sprayed directly thereon. Prior to use the surfaces within the housing are cooled from the lowermost progressively upwardly thereby driving out air and reducing condensation of moisture; after use the procedure is reversed in order to permit substantially complete recovery of the refrigerant.

3,605,430

SYSTEM FOR COOLING BEVERAGES

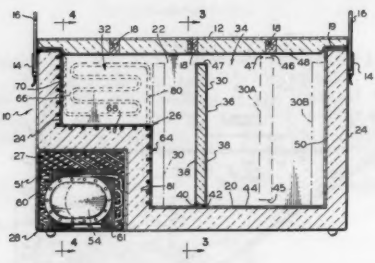
Robert F. Conti, Easton, Pa., assignor to Follett Corporation, Easton, Pa.

Filed May 22, 1969, Ser. No. 826,976
Int. Cl. F25c *1/00*
U.S. Cl. 62—137 **4 Claims**



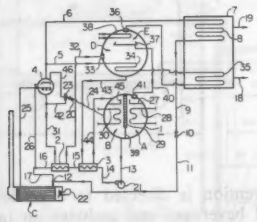
Thjs invention is directed to a cooler for post mix carbonated beverages and includes an insulated cabinet for retaining ice and at least one horizontal ingredient cooling coil located adjacent the bottom of the cabinet. The ice rests on a support screen above the coil and progressively melts to form a cold water bath around the coils. Excess water is drained off at a predetermined level above the support screen and the water bath is agitated. Bin level sensors may be used to control admission of ice to the cabinet.

3,605,431
PORTABLE REFRIGERATOR-FREEZER
John L. Carson, P.O. Box 141, Woodburn, Oreg. 97071
Filed Sept. 10, 1969, Ser. No. 856,662
Int. Cl. F25b
U.S. Cl. 62—190 **5 Claims**



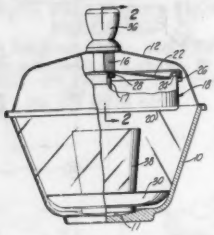
A portable two-temperature zone refrigerator having a movable partition disposed within a food receiving cabinet to divide the same into two adjustably sized food receiving sections. The partition is substantially equal to the width of the interior of the cabinet and has a depth less than the depth thereof selectively to permit refrigerated air to circulate vertically around the partition and thus between the two food receiving sections. The interior walls of the cabinet are made of metal. Refrigerating means are disposed within at least one of the food receiving sections and comprise a refrigerating coil attached to the metal interior wall of such food receiving section. Thermostatic control means are provided to adjust the temperature so as to achieve a temperature differential between the two food receiving sections. Vertical adjustment of the movable partition permits variation in the temperature differential between the two sections, while removal of the partition permits the entire cabinet to achieve one temperature which may selectively be below freezing.

3,605,432
ABSORPTION REFRIGERATING SYSTEM
Masaji Wada, 682 Marukodori 2-chome, Kawasaki-shi, Kanagawa-ken, Japan
Filed Jan. 23, 1969, Ser. No. 793,485
Claims priority, application Japan, Jan. 26, 1968, 43/4,724; Jan. 29, 1968, 43/5,314
Int. Cl. F25b *15/06*
U.S. Cl. 62—324 **12 Claims**



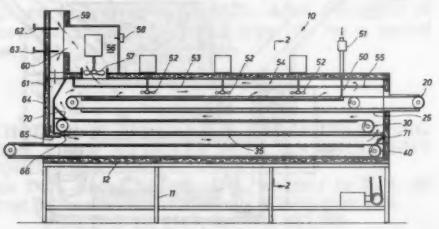
A direct fire type double-effect absorption refrigerating system comprising as its principal component devices an evaporator, an absorber, a generator, a condenser and two solution heat-exchangers and in which a hot water for service forming device is provided in parallel to a refrigerating cycle system or heat pump cycle system and refrigerant gas is directly or indirectly introduced from a generator which is heated from an external heating source or a liquid separator connected to said generator into said hot water forming device thereby to form a condensed refrigerant liquid which is to be recycled to said generator.

3,605,433
SALAD BOWL
John Strathaus, 11835 Highwater Road, Granada Hills, Calif. 91344
Filed Nov. 10, 1969, Ser. No. 875,451
Int. Cl. F25d *3/08*
U.S. Cl. 62—371 **4 Claims**



A salad bowl having a circular bottom bowl portion covered by a circular lid, the lid of the bowl having a refrigerant containing compartment detachably suspended from the lid of said bowl and thermally insulated therefrom to retain a cooler interior of said bowl and at the same time to prevent frosting of said bowl and lid as well as preventing the rapid loss of coolant media to the atmosphere.

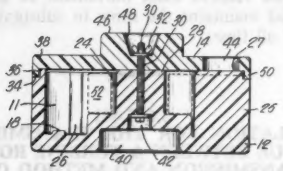
3,605,434
REFRIGERATION APPARATUS INCLUDING A CONVEYOR AND EMPLOYING CRYOGENIC FLUID
Harold L. Boese, Houston, Tex., assignor to James L. Foster and W. D. Boyd, Houston, Tex., fractional part interest to each
Filed Nov. 12, 1969, Ser. No. 875,825
Int. Cl. F25d *17/00*
U.S. Cl. 62—374 **7 Claims**



Refrigeration apparatus using a cryogenic liquid wherein the apparatus includes multiple segments of a conveyor system which are stacked one on top of the other in a single chamber and the cryogenic liquid is introduced approximately near the point where the food to be frozen is introduced to place a quick surface freeze thereon to protect the quality of the product, and wherein the cryogenic liquid evolves a cold gas which is drawn off and forced back along the conveyor system in a counter flow traveling along the length of the various conveyor segments and the apparatus further includes a chimney for conducting

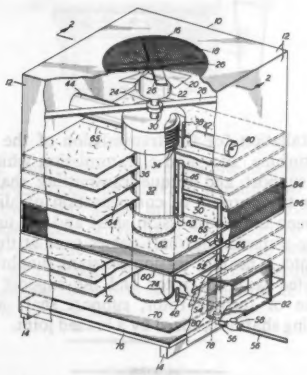
hot gases away from the apparatus, the chimney being connected with the gas flow system and the amount of gas deviated to the chimney and the amount directed to the gas flow system being controlled by louvers placed in the system.

3,605,435
COOLER
Frank Taylor, 1319 Bernie St., La Salle, Quebec, Canada
Filed Dec. 29, 1969, Ser. No. 888,563
Int. Cl. F25d *3/08*
U.S. Cl. 62—457 **10 Claims**



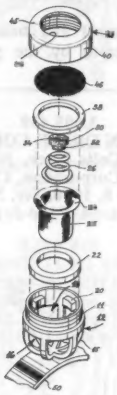
A cooler formed from a bottom and top section mounted for relative rotational movement, a plurality of compartments arranged in a circle in the bottom section, a coolant chamber positioned within the circle and individual passages connecting the coolant chamber with each withdrawn or dispensed individually by permitting access opening therein which opening may, by relative rotation of the two sections, be aligned with selected of said compartments.

3,605,436
CENTRIFUGAL ABSORPTION AIR CONDITIONER
Oscar Elbridge Gammill, Jr., P.O. Box 52, Skaneateles, N.Y. 13152
Continuation of application Ser. No. 711,037, Mar. 6, 1968. This application Aug. 29, 1969, Ser. No. 858,559
Int. Cl. F25f *15/04*
U.S. Cl. 62—476 **30 Claims**



In one exemplar embodiment, a gas heated absorption air conditioning system is disclosed, utilizing a rotating cylindrical vessel in which the functions essential to the absorption cycle are performed and heat rejection is effected between a heating or cooling medium and a portion of the outer wall of the cylindrical vessel. The cylindrical vessel, containing a predetermined quantity of an absorptive fluid, is evacuated and sealed and then rotated at a predetermined rotational velocity. The centrifugal and velocity forces created by the rotating vessel evenly distribute the absorptive fluid over the inner walls of the cylinder and provide the motive force to cause circulation of the fluid during the absorption cycle without the need for pumps to maintain such fluid circulation.

3,605,437
ARTICLE OF JEWELRY INCLUDING AN INCENSE BURNER
Garfield G. Litton, 1360 Ocean Parkway, Brooklyn, N.Y. 11230
Filed Feb. 12, 1970, Ser. No. 10,946
Int. Cl. A44c *25/00*
U.S. Cl. 63—1A **10 Claims**



An article of jewelry includes an incense burner comprising an open casing or ring which supports an open mesh basket in which a pellet can be set and ignited to emit a strong fragrance. The basket is thermally insulated from the casing so that heat is conducted away from the casing by an air draft which passes through the basket. The air draft supports combustion and carries the emitted fragrance. A bracelet, ring, chain of beads, or the like, is secured to the casing so that the burner is wearable as an article of costume jewelry. Since the casing remains cool or, at most, moderately warm while the incense is burning, it can be worn safely in contact with a person's finger, arm, neck or other body part.

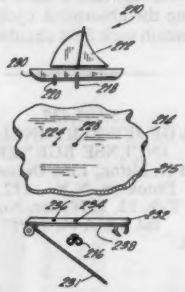
ERRATUM

For Class 63—15 see:
Patent No. 3,605,442

3,605,438
BAR PIN WITH CHANGEABLE NON-ROTATABLY SECURED ORNAMENT AND INTERMEDIATE MEMBER
Bernard Chalson, Lawrence, N.Y., assignor to William Chalson & Co., Inc., New York, N.Y.
Filed Sept. 10, 1968, Ser. No. 758,792
Int. Cl. A44c *1/00*
U.S. Cl. 63—20 **2 Claims**

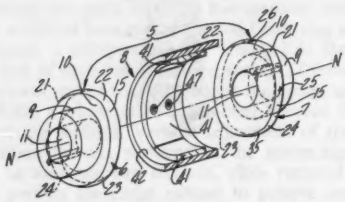
An article of jewelry having interchangeable ornamentation comprising interchangeable separate decorative elements and interchangeable separate bases with means depending from the decorative elements through

the bases and locking means for holding the decorative elements and decorative bases in non-rotatable and superposed relation to each other. A bar pin is also provided



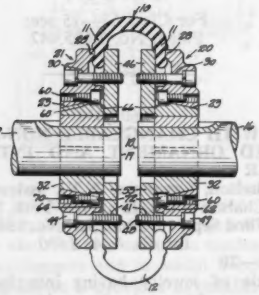
and a respective element and base may both be non-rotatably secured thereto by the previously mentioned means.

3,605,439
TORSION DRIVE COUPLING
Leslie Filepp, Colts Neck, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed May 8, 1970, Ser. No. 35,647
Int. Cl. F16d *3/18*
U.S. Cl. 64—9R **12 Claims**



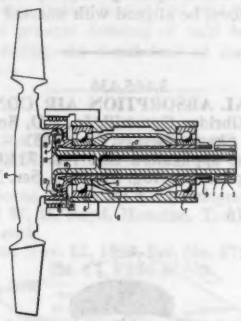
A gear-type coupling for connecting in-line shafts in driving relationship. Basic parts of the coupling are a pair of shaft-receiving hubs and a double-ended sleeve or spacer for receiving the hubs. The cooperating external and internal tooth surfaces of the parts are based on a four-tooth configuration resulting in a somewhat quadratic pattern of radially-outwardly convex sides.

3,605,440
FLEXIBLE COUPLING
David Firth, 1441 E. Jefferson Blvd., South Bend, Ind. 46617
Filed May 4, 1970, Ser. No. 34,024
Int. Cl. F16d *3/52*
U.S. Cl. 64—11R **5 Claims**



A flexible coupling wherein a pair of hub members having tapered bores each encircles a split tapered bushing projecting axially from one side thereof and having a normal slide fit on a shaft. An annular clamp plate is carried by each hub member and has an inner marginal portion abutting the projecting end of the adjacent bushing and an outer marginal portion for clamping a margin of a flexible annular torque-transmitting member against a margin of the cooperating hub member when advanced toward said hub member, whereby to connect said bushing, hub and flexible member in drive-transmitting relation. Connector means are carried by each hub and engage the associated bushing to define a sub-assembly of a bushing, a hub and a clamp plate which accommodates limited relative axial movement of said hub and bushing and maintains the same in substantially coaxial relation at all times.

3,605,441
INSTALLATION FOR THE TRANSMISSION OF TORQUE BETWEEN A TURBINE ROTOR AND A TRANSMISSION AND METHOD OF MANUFACTURE THEREOF
Klaus Hagemeister, Munich, Germany, assignor to Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany
Filed July 23, 1969, Ser. No. 843,984
Claims priority, application Austria, July 24, 1968, A 7,168/68
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 **11 Claims**

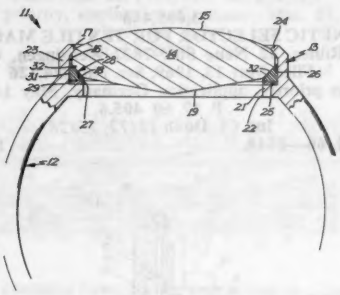


An installation for the transmission of the torque between a turbine rotor and a transmission which includes separate support and torque-transmitting shafts, and in which for the purpose of compensation of alignment errors between the transmission shaft and the turbine rotor the torque-transmitting shaft passes over at the rotor-end thereof into a flexible torsion-resistant diaphragm which is connected with the rotor and the support shaft. The connection of turbine rotor, support shaft and torque-transmitting shaft is realized by a brazed joint.

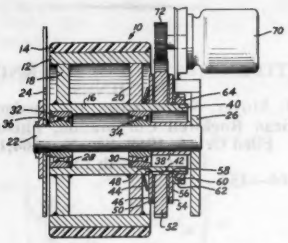
3,605,442
JEWELRY MOUNTING HAVING COMBINED CUSHION AND SEALING MEANS
James E. Parker and John S. Titus, Jr., Owatonna, Minn., assignors to Jostens, Inc., Owatonna, Minn.
Filed May 26, 1969, Ser. No. 827,776
Int. Cl. A44c *9/00*
U.S. Cl. 63—15 **7 Claims**

An improved ring having a novel plastic cushion positioned in and extending completely around the ring bezel. The ring stone rests on and is supported in the bezel

by an inwardly tapered seating surface formed on the plastic cushion so as to provide a relatively shock resistant setting for the ring stone. The surface of the plastic cushion is constructed and arranged so as to form a liquid seal between the ring stone and the plastic cushion and between the cushion and the bezel.



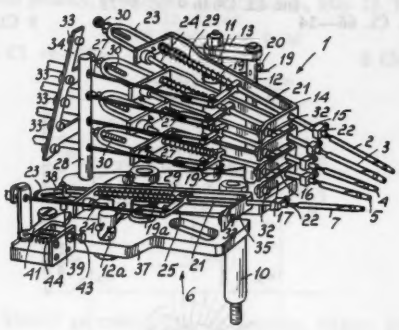
3,605,443
TORQUE LIMITER
Paul E. Redelman, South Holland, Ill., assignor to Interlake Steel Corporation
Filed Aug. 4, 1969, Ser. No. 847,243
Int. Cl. F16d *7/02*
U.S. Cl. 64—30 **5 Claims**



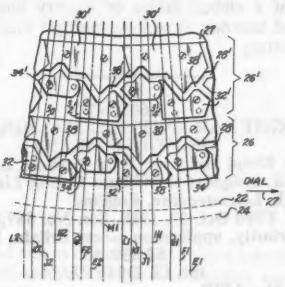
A torque limiter for preventing the transmission of excessive torque from the wheel of a vehicle to the vehicle in the event the wheel drive train becomes locked, which includes a pair of friction pads urged into frictional engagement with the opposite sides of the wheel drive gear so as to normally transmit driving torque to the wheel but enable the wheel to slip relative to the drive gear if the drive gear locks.

3,605,444
THREAD FEED UNIT FOR DOUBLE CYLINDER KNITTING MACHINES
Francesco Lonati, Via S. Polo 11, Brescia, Italy
Filed Apr. 14, 1969, Ser. No. 815,669
Claims priority, application Italy, Apr. 19, 1968, 15,496/68
Int. Cl. D04b *9/10, 15/58*
U.S. Cl. 66—14 **4 Claims**

This disclosure relates to a feed unit for double cylinder knitting machines, comprising a plurality of guide supports mounted about a fixed vertical shaft for oscillation between a feed position and a rest position, a thread carrier mounted on each of said guide supports for longitudinal sliding to and from the needle cylinders, cable means being arranged eccentric to said fixed shaft for causing a thread carrier to slide away from said needle cylinders before the oscillation of the relative guide support towards the rest position.

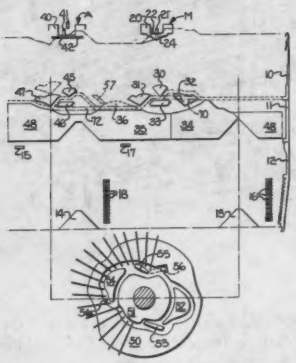


3,605,445
METHOD OF KNITTING AND CAMMING MECHANISM THEREFOR
Morris Philip, 2519 Grand Ave., Bronx, N.Y. 10468
Filed Dec. 12, 1968, Ser. No. 783,189
Int. Cl. D04b *9/00*
U.S. Cl. 66—17 **19 Claims**



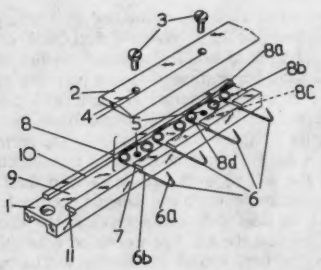
This invention relates to a method of knitting with a circular knitting machine having a first bank of needles and a second bank of needles, with the needles of at least the second bank being divided into a plurality of sets. A plurality of successive courses are knit with one of the sets of the second bank, each course being knit with a set of needles of the second bank different from the set used to knit the preceding course, and in each course the needles of the second bank are delayed in their knitting cycle at a position wherein the delayed needles have been pulled back at least sufficiently to clear the cooperating needles of the first bank but at a position where they have not been pulled back sufficiently for the old loops thereon to be cast off, so that during the delay the loops on the needles of the second bank remain on the outside of the closed latch. The delayed needles are pulled in to cast off their stitches about when the needles used in the next course reach their cleared point. The invention also provides a camming mechanism for performing the method.

3,605,446
RIB AND TERRY KNITTING MACHINE AND METHOD
Herman E. Crawford, Jr., and James H. Wells, Kernersville, N.C., assignors to H. E. Crawford Co., Inc., Kernersville, N.C.
Filed Jan. 23, 1969, Ser. No. 793,258
Int. Cl. D04b *9/06, 9/12*
U.S. Cl. 66—24 9 Claims



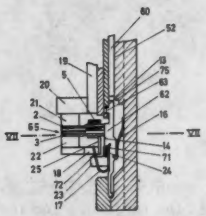
A multiple feed circular hosiery knitting machine is provided with means for forming terry loops at one knitting station and for forming a rib fabric at a subsequent knitting station. This invention is particularly adapted for use in forming socks wherein the upper cuff portion is knit of ribbed fabric while the sole portion is provided with terry loops. The present method permits the selected knitting of a ribbed fabric or a terry loop fabric in a single feed manner, as well as multiple feed plain or patterned knitting.

3,605,447
STRAIGHT BAR KNITTING MACHINE FABRIC DRAW-OFF MEANS
Raymond Blood and Alan John Pearson, Loughborough, England, assignors to William Cotton Limited, Loughborough, Leicestershire, England
Filed Oct. 17, 1969, Ser. No. 867,305
Claims priority, application Great Britain, Nov. 2, 1968, 52,039/68
Int. Cl. D04b *27/34*
U.S. Cl. 66—149R 4 Claims



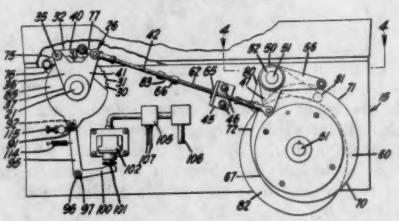
Straight bar knitting machine draw-off bar in which the draw-off hook elements are each individually spring mounted e.g. by tail portions of the elements being looped or coiled thus providing spring formations which are accommodated in a longitudinal groove in the bar, for the purpose of the elements being independently self-adjustable to a working load when applied.

3,605,448
MAGNETIC SELECTOR FOR TEXTILE MACHINES
Erich Ribler, 22 Neue Str., 7832 Kenzingen, Germany
Filed May 13, 1969, Ser. No. 824,126
Claims priority, application Germany, May 14, 1968, P 17 60 405.6
Int. Cl. D04b *15/72, 15/28*
U.S. Cl. 66—154A 14 Claims



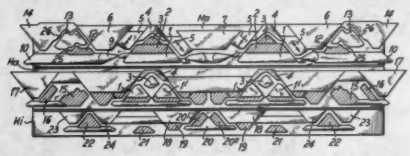
Jacks, sinkers, or like control elements are selectively moved between a first position sliding on a permanently magnetized slide surface, and a second position to which the control elements are moved by springs when a selector magnet is energized in accordance with a program to counteract the magnetic force of the slide surface in the region of a cutout in the same.

3,605,449
PATTERN MECHANISM FOR KNITTING MACHINES
James D. Moyer, Wyomissing, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Oct. 6, 1969, Ser. No. 864,140
Int. Cl. D04b *15/66*
U.S. Cl. 66—154 8 Claims



Pattern mechanism for a circular knitting machine, the pattern mechanism including a cam drum, first and second pawls for indexing the cam drum in steps of equal extent, and means for controlling the operation of the pawls whereby both pawls may be operated successively to index the cam drum during each rotation of a pair of rotations of the needle cylinder of the machine, or one of the pawls may be operated to index the cam drum in only one of a pair of cylinder rotations and the other of the pawls may be operated to index the cam drum in only the other of a pair of cylinder rotations.

3,605,450
CAM SYSTEM FOR AUTOMATIC JACQUARD FLAT KNITTING MACHINES
Ernst Goller, Pfullingen, and Karl Essig and Helmut Mutschler, Reutlingen, Germany, assignors to H. Stoll and Company, Reutlingen, Germany
Filed Mar. 24, 1969, Ser. No. 809,825
Claims priority, application Germany, Mar. 23, 1968, P 17 60 025.8
Int. Cl. D04b 7/04
U.S. Cl. 66—78 4 Claims

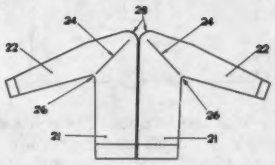


A cam assembly for a double lock system in a Jacquard flat knitting machine. The needles, the main jacks and the auxiliary jacks are guided by a needle guide plate, a main jack guide plate and an auxiliary jack guide plate, respectively. Guide cams for the transfer and receiving of stitches are located at each end of the main jack guide plate; the advancing cams of the main jack guide plate are constructed in two halves for stitch and loop formation; and the auxiliary jack guide plate includes at each end thereof run-in cams which permit additional selection of main jacks through the medium of the auxiliary jacks.

3,605,451
DETACHABLE HOSE WITH KNITTED FABRIC LOOPS
Aaron Burleson, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Continuation-in-part of application Ser. No. 742,082, July 2, 1968. This application Mar. 21, 1969, Ser. No. 809,354
Int. Cl. D04b 9/54
U.S. Cl. 66—172 6 Claims

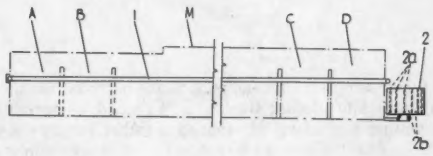
A stocking and usually the welt of the stocking is provided with integral, knitted fabric loops by which the stockings are attached to a panty, girdle or other support garment by a fastener of small and thin dimensions. The loops are formed by float stitching wherein a number of selected needles are pulled down to sinker level, where they do not take any yarn, kept there for a selected number of courses and then placed back in action with the needles again taking yarn. The needles pulled down to the sinker level to effect the formation of the loops, can be needles which knit the wales in which the loops are formed, the needles which knit the wales intermediate the loops or various combinations of these two sets of needles with the yarn being alternately floated for selected courses behind each set of needles while the other set of needles is knitting to thereby form the integral knitted fabric loops.

3,605,452
KNITTED GARMENT BLANKS
Richard James Carter, Wigston Magna, and Dennis Gell, Leicester, England, assignors to The Bentley Engineering Company Limited, Leicester, England
Filed May 6, 1969, Ser. No. 822,226
Claims priority, application Great Britain, May 11, 1968, 22,490/68
Int. Cl. D04b 1/24, 9/20
U.S. Cl. 66—176 5 Claims



A knitted garment blank, or seamless tubular form, consists of two integral tubular portions disposed at an angle to each other and connected by an integral fashioned pouch having opposed sutures, formed by narrowing and widening, extending from closely adjacent points in the inner corner of the angle towards the peak of the pouch.

3,605,453
STRAIGHT BAR KNITTING MACHINES
Raymond Blood, Shepshed, near Loughborough, England, assignor to William Cotton Limited, Loughborough, England
Filed Feb. 28, 1969, Ser. No. 803,254
Claims priority, application Great Britain, Mar. 8, 1968, 11,541/68
Int. Cl. D04b 9/40
U.S. Cl. 66—148 7 Claims

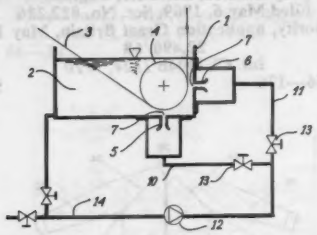


A method and means of collecting knitted blanks pressed off from a multi-section straight bar knitting machine in which a front endless conveyor delivers pressed off blanks from the respective knitting sections into respective compartments in an end receptacle, and electric motors driving the conveyor and the receptacle are under electric switch control including electric switches operable by switch operating members movable with the conveyor and the electric switch operable by movement of the receptacle, whereby sets of different shaped or sized blanks from the respective knitting sections are kept separate from each other.

3,605,454
METHOD AND APPARATUS FOR THE CONTINUOUS WET TREATMENT OF TEXTILE FABRICS
Peter Schroeder, Arni, Switzerland, assignor to Paul Weber AG, Rothrist, Switzerland
Filed Dec. 3, 1968, Ser. No. 780,631
Claims priority, application Switzerland, Jan. 8, 1968, 232/68
Int. Cl. B05c 3/12, 8/04
U.S. Cl. 68—62 8 Claims

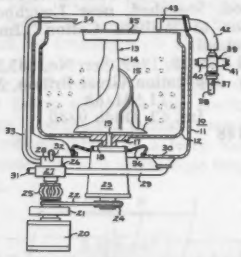
A method and apparatus for the continuous wet treatment of fabrics involves leading the fabrics through a

wet treatment zone extending over the entire width of the fabrics. In the wet treatment zone, the fabrics are subjected to jets of the treatment liquid, the jets being wide band jets which are laminar, dimensionally stable,



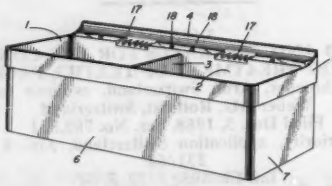
and fixed as to time and location. These jets are directed against the textile materials under pressure and at an angle of between 45 and 135° to the surface of the fabrics, the pressure being such that the jets press through the textile material.

3,605,455
WATER ADMISSION MEANS
Eugene G. Olthuis, Louisville, Ky., assignor to General Electric Company
Filed Nov. 14, 1968, Ser. No. 775,626
Int. Cl. D06f *37/00, 39/00*
U.S. Cl. 68—207 **9 Claims**



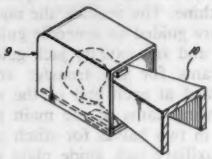
Water admission means particularly adapted for use in an automatic clothes washer is provided comprising a downwardly opening cup-shaped member having an upwardly directed inlet to direct a stream of water into the cup-shaped member. A plurality of projections depend from the cup-shaped member into the stream of water to break up and spread out the flow of water as it discharges into the washing basket.

3,605,456
TWIN LAUNDRY TUBS
Morris Klimboff, Wyoming, and Anthony Buonaura, Greenhills, Ohio, assignors to Formica Corporation, Cincinnati, Ohio
Filed Feb. 12, 1970, Ser. No. 10,897
Int. Cl. D06f *1/02*
U.S. Cl. 68—232 **3 Claims**



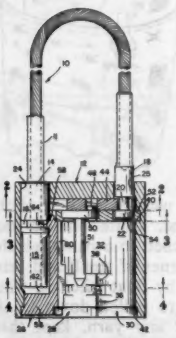
Twin laundry tubs are molded in a single piece of reinforced plastic with front, back, side and bottom walls in each tub and the dividing wall between the two tubs being solid and extending substantially to the bottom. The side walls are provided with rearward extensions or fins, and there is an integral molded rear piece and splash board extending across the back. This provides an opening in which a lighter and simplified wall bracket can be inserted. The tubs are provided with integrally molded holes on the four corners to receive legs when the tubs are to be supported on the floor, the holes being provided with splines fitting with grooves in the legs so that the latter on insertion cannot turn and become loose.

3,605,457
TRAILER HITCH LOCK
William D. Foster, 1414 Pirate's Cove, Houston, Tex. 77058
Filed Apr. 23, 1970, Ser. No. 31,128
Int. Cl. E05b *73/00*
U.S. Cl. 70—14 **10 Claims**



An apparatus for preventing access to a trailer hitch including an enclosure about the end of the hitch and a substitute towing ball carried on a wall segment of the enclosure for insertion into the ball socket of the hitch. A wall segment of the enclosure is pivotally connected to the enclosure to allow insertion and removal of the substitute ball and a concealed lock is provided to retain the enclosure about the hitch.

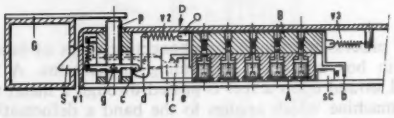
3,605,458
CABLE SHACKLE PADLOCK WITH PLUG-RETAINED CABLE
Walter E. Best, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.
Filed July 15, 1970, Ser. No. 54,974
Int. Cl. E05b *9/08, 35/10, 67/06, 67/22*
U.S. Cl. 70—49 **10 Claims**



A padlock having a shackle in the form of a flexible cable of selected length. A secure construction and easy assembly is provided. The cable heel piece is permanently but rotatably secured in the lock case by interengagement inside the case with a shackle plug which is inserted with the heel piece from the rear and then turned to bayonet locked engagement with lugs in the case. Insertion of a lock core blocks release of the shackle plug. The cable toe piece is releasably secured by a slidable bolt. A bolt

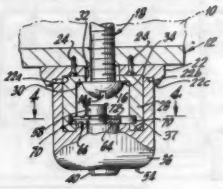
retaining plate is forced into, and retained in a supporting groove by a cam on the shackle plug as such plug is inserted, and the plate then braces the plug in secure engagement with the cable heel. To provide dead-bolt action, the bolt is actuated both for locking and release by a throw member controlled by key operation of the lock core.

3,605,459
DOOR-LOCK
Christiaan Johannes van Dalen, Voorburg, Netherlands, assignor to De Staat der Nederlanden, Ten Deze Vertegenwoordigd door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, Hague, Netherlands
Filed Dec. 11, 1969, Ser. No. 884,248
Claims priority, application Netherlands, Dec. 16, 1968, 6818018
Int. Cl. E05b *19/00, 35/00, 47/04*
U.S. Cl. 70—144 **6 Claims**



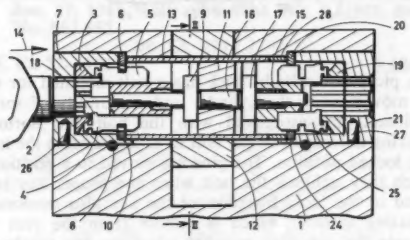
A door jamb and a door without a handle or keyhole containing a lock, which may be a magnetically operated tumbler type lock operated by a magnetic key, which when pressed against said door adjacent said lock, and mechanical means in the door initiated by pressing the door towards its jamb to move the relative parts of said lock to operate and retract the latch for the door and retain it retracted until the door is opened by a spring urged pin normally pressing against the door jamb.

3,605,460
BOLT HEAD LOCK
M. Leonard Singer, 1500 Cardinal Drive, Little Falls, N.J. 07424, and Robert M. Woletz, 294 Buttonwood Drive, Paramus, N.J. 07652
Filed Jan. 27, 1969, Ser. No. 794,047
Int. Cl. F16b *41/00;* **E05b** *73/00*
U.S. Cl. 70—232 **18 Claims**



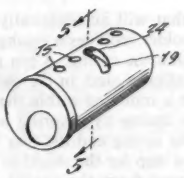
A device for locking typewriters and similar articles which are adapted to be positioned in a fixed location on a mounting platform or desk comprises an inner cylindrical member which includes a bore through its closed end which is adapted to receive a securing bolt which is provided for anchoring the article to the mounting location. The head of the securing bolt is adapted to engage over a ledge formed at the inner end of the inner cylindrical member and the head can be affixed to the cylindrical member such as by welding. The cylindrical member is carried on a flat plate or washer which includes means for fixing it to the mounting base for the article in a manner such that it will not rotate. When the lock is opened the cylindrical member is exposed to permit access to the head of the screw by a screw driver wrench so that it can be unthreaded to release the article. The inner cylindrical member is adapted to interengage with an outer cylindrical member or locking head which has an opened end into which the inner cylindrical member is directed and a closed end carrying a key engagement fitting. The key engagement fitting accommodates a key which may be rotated to shift a bolt member carried by the outer cylindrical member laterally to engage in a slot of the inner cylindrical member and to thus hold the assembly together. The assembly covers the bolt head so that the securing bolt cannot be rotated to effect disengagement from the article held thereby.

3,605,461
CYLINDER LOCK
Roger Felix Frank, Rue du General Ferrie, Haute-Savoie, France
Filed Jan. 14, 1970, Ser. No. 2,696
Claims priority, application France, Jan. 16, 1969, 6,900,800
Int. Cl. E05b *9/10, 17/04, 29/00*
U.S. Cl. 70—363 **6 Claims**



A cylinder type lock having a unitary body defining a cylindrical hole therein, a splined key entry channel inserted in each end of said hole, splines on said body projecting into said hole and engaging said splines on said key entry channels, a slotted barrel in each said key entry channel and rotatable therein by means of a key, a tumbler slidable in each of said barrel slots, a pair of crenulated washers fixed in said hole by engagement of said crenulations with said splines on said key entry channels and said body splines, a catch member located between said barrels, and a rectangular member associated with each barrel and adapted to couple said barrel with said catch member on insertion of said key in said barrel.

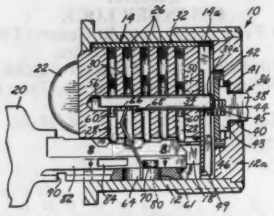
3,605,462
ONE WAY KEY OPERATED LOCKING MECHANISM
Robert Hermann, P.O. Box 114, Stronghurst, Ill. 61480
Filed Oct. 1, 1969, Ser. No. 862,726
Int. Cl. E05b *27/02*
U.S. Cl. 70—364A **2 Claims**



A locking mechanism which is one way key operated, the device comprising a lock consisting of a cylinder in which a core is inserted, the core being structurally modified so that when a regular operating key is inserted,

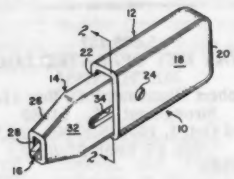
the lock will rotate fully in either direction but wherein with a special key the core is rotatable only one way around in either direction to which it is designed.

3,605,463
PICKPROOF CYLINDER LOCK
Norman Epstein, Rte. 301, Carmel, N.Y. 10512
Filed Oct. 31, 1969, Ser. No. 872,837
Int. Cl. E05b *15/14, 17/04, 27/00*
U.S. Cl. 70—364A **9 Claims**



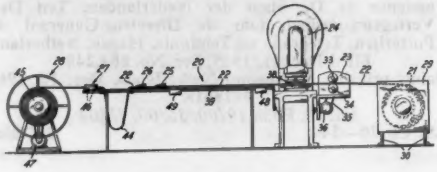
A pickproof cylinder lock has a bolt mounted for sliding movement in the cylinder and a plurality of spring-tensioned pins associated with the bolt and normally blocking movement of the bolt so as to maintain the latter in a locked position. The pins are moved to a position in which they unblock the bolt when the proper key is inserted in the lock. Insertion of the key also tensions an actuating member which is remote from the pins and releases the actuating member when the key reaches its fully inserted position, the released actuating member thereupon imparting a sharp, instantaneous actuating stroke to the bolt to drive it to an unlocked position if the bolt has been unblocked by the pins.

3,605,464
SELF-EJECTING KEY HOLDER WITH RETRACTABLE SHIELD
Seymour A. Ostrager, 1188 Grand Concourse, Bronx, N.Y. 10457
Filed Dec. 22, 1969, Ser. No. 886,808
Int. Cl. E05b *19/00*
U.S. Cl. 70—414 **5 Claims**



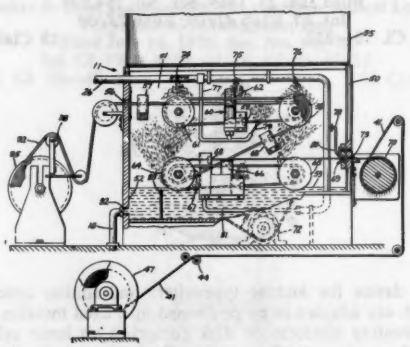
A key holder that will automatically eject a key from a lock. The key holder includes a casing and a shield slidably mounted within the casing. A pin passes through the casing, a pair of aligned slots in the shield and the opening in a key which is mounted within the shield. The shield is urged from the casing by a spring positioned between the rear wall of the casing and the rear wall of the shield. The pin serves as a stop for the shield to prevent the shield from being displaced from the casing. The spring-urged shield serves to eject the key from the lock, by the bearing of the front of the shield against the face plate of the lock. The front of the shield is tapered toward the enclosed key to facilitate the sighting of the lock for the insertion of the key.

3,605,465
METHOD AND ARRANGEMENT FOR PRODUCING CONNECTING STRIPS OF BAND
Hans Jochen Timmerbeil and Hugo Timmerbeil, Jr., Schwelm, Westphalia, Germany, assignors to Titan Eisenwarenfabrik G.m.b.H., Schwelm, Westphalia, Germany
Filed Nov. 21, 1968, Ser. No. 777,724
Int. Cl. B21d *43/28, 28/00;* **B26d** *3/00, 5/20, 5/38;* **G01n** *21/30;* **B65f** *23/18*
U.S. Cl. 72—10 **10 Claims**



A process for producing connecting strips of band for use in box strapping and baling applications. A blank band wound upon a reel is passed through a metal working machine which applies to the band a deformation at predetermined strip lengths. A sensing device spaced from the metal working machine at a distance equal to the desired length of the strip, detects the deformation applied to the band and in response actuates the metal working machine to apply a subsequent deformation.

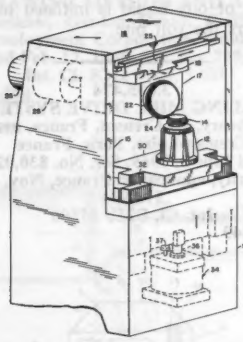
3,605,466
APPARATUS FOR DRAWING METAL WIRE AND THE LIKE AND THE METHOD THEREOF
Frank B. Kilcoin, 4514 Beaver Ave., Fort Wayne, Ind. 46807
Continuation of application Ser. No. 674,537, Oct. 11, 1967. This application Nov. 26, 1969, Ser. No. 880,227
Int. Cl. B21b *45/02*
U.S. Cl. 72—43 **7 Claims**



An apparatus and method for drawing continuously moving aluminum wire. The apparatus includes one or more drawing machines having a housing that forms a drawing chamber and a reservoir for liquid drawing lubricant. Drawing dies are mounted within the drawing chamber in coaxial relationship with respect to the moving wire, and at least an upper and a lower tier of drawing blocks direct and pull the moving wire through the dies. The level of the drawing lubricant in the reservoir is maintained above a predetermined level so that the liquid lubricant wets at least one of the drawing blocks of the lower tier thereby to cause the liquid lubricant to be sprayed and cooled by the drawing block or

blocks of the lower tier. The drawing machine is connected in a closed flow loop which includes a storage tank, a pump, a lubricant cooler and control valve.

3,605,467
ROLLING OF TAPERED GEARS
John M. White and Richard W. Tersch, Grosse Pointe Woods, and Raymond S. Kusz, Mount Clemens, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Filed Oct. 30, 1969, Ser. No. 872,691
Int. Cl. B21d *53/28*
U.S. Cl. 72—84 11 Claims

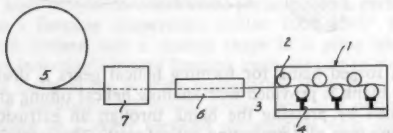


A machine for finish rolling rough cut tapered gears such as hypoid gears, comprising means for meshing a tool or die in the form of a hypoid ring gear with a hypoid pinion in properly meshed relation, and establishing rolling pressure between the die and pinion by effecting advance of the die or pinion in a direction parallel to its axis.

3,605,468
GEAR ROLLING
Raymond A. Okray, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Aug. 4, 1969, Ser. No. 847,213
Int. Cl. B21h *5/02*
U.S. Cl. 72—108 3 Claims

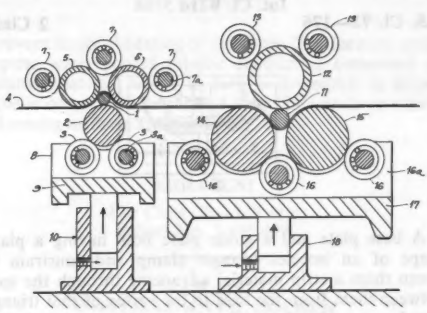
Since forming gears by rolling, particularly from the solid, tends to displace material laterally at the ends of the teeth beyond the side of the blank, the ends of the rolled teeth may not be fully formed. To counteract this the blank has teeth partially formed thereon to provide excess material adjacent the ends of the teeth.

3,605,469
METHOD AND APPARATUS FOR IMPROVING THE PROPERTIES OF STEEL ROPE
Martin T. Queralto, Calle Iborra 15, Barcelona, Spain
Filed Sept. 23, 1968, Ser. No. 761,704
Claims priority, application Spain, Sept. 23, 1967, 345,790
Int. Cl. B21c *37/04*; B21f *9/00*
U.S. Cl. 72—128 11 Claims



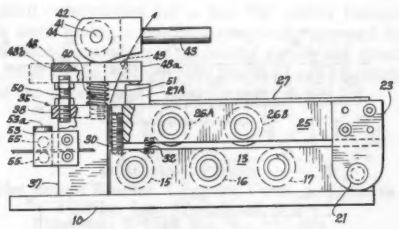
A method and apparatus for improving the properties of steel rope. The steel rope is subjected to a force of traction which is less than the tension required to break the rope, and while under this tension the rope is passed through a heating zone so that a given degree of stretching will be imparted to the rope. Prior to reaching the heating zone, where a suitable heating means is located, the rope is directed through an undulatory path by an adjustable roller means causing the rope to be sequentially directed along opposed curves, so that in this way prior to reaching the heating means the rope is stressed and preliminarily heated to a given degree. The tension is applied to the rope by winding the latter onto a drum which pulls the rope through the undulatory path and the heating means, and between the heating means and the take-up drum the rope is cooled either by the ambient atmosphere or through forced cooling.

3,605,470
PRESSURE ASSISTED TENSION ROLLER LEVELER
Natalis H. Polakowski, 226 Laurel Ave., Wilmette, Ill. 60091
Continuation-in-part of application Ser. No. 793,981, Jan. 27, 1969. This application Oct. 3, 1969, Ser. No. 863,657
Int. Cl. B21d *1/02*
U.S. Cl. 72—163 9 Claims



A pressure assisted tension roller leveler embodying means for applying pressure normal to the stip during passage between the work roll and the flexure rolls and for providing flexibility crosswise between the work roll and flexure rolls.

3,605,471
PULL-THROUGH STRAIGHTENER
Robert Gray Bodtke, 1308 E. Seiberling, Peoria, Ill. 61614
Filed Mar. 30, 1970, Ser. No. 23,862
Int. Cl. B21d *1/02*
U.S. Cl. 72—165 9 Claims



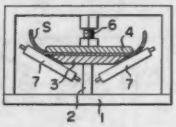
A straightener for metal strip stock from a stock supply reel so that the straightened stock may be handled by an

automatic feed to a punch press has conventional top and bottom generally horizontal arrays of straightener rolls. The generally horizontal spacing between laterally offset adjacent roll axes is unusually great in comparison to current practice—in the order of two roll diameters. Such a roll spacing greatly reduces power requirements for pulling stock through a straightener, has other advantages set forth in detail including the ability to pivotally secure the top roll array, permitting the straightener to be readily opened with such a construction. The spacing between adjacent rolls toward the exit end is preferably reduced for obtaining desired operating characteristics as well as for geometrical reasons where the top roll array is pivotally mounted.

3,605,472
APPARATUS FOR FABRICATION OF STRUCTURES

Akihiro Saito and Takashi Nakamura, Kawasaki-shi, Kanagawa-ken, Japan, assignors to Kabushikikaisha Dengensha Seisakusho, Kanagawa-ken, Japan

Filed May 12, 1969, Ser. No. 823,884
Claims priority, application Japan, May 21, 1968, 43/34,172; June 28, 1968, 43/45,331; Sept. 25, 1968, 43/69,358; Oct. 7, 1968, 43/72,949; Jan. 30, 1969, 44/6,970
Int. Cl. B21d *5/08*
U.S. Cl. 72—176 **2 Claims**

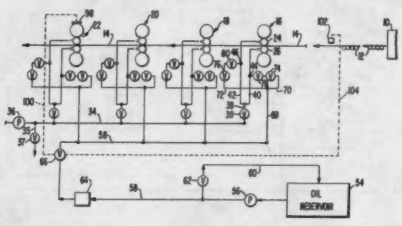


A base plate and a guide plate both having a planar shape of an isoceles triangle clamp and constrain between them a strip material advancing through the space between them from the base to the vertex of that triangle, thereby emerging from that space and successively contacting, from its laterally outermost edge part to its inner part, low-friction forming members which progressively bend and curl the material, ultimately into a tubular form.

3,605,473
METHOD AND APPARATUS FOR HOT ROLLING FERROUS METAL WORKPIECES

Lockwood Lyon, Bloomfield Hills, and William H. Rees, Dearborn, Mich., assignors to National Steel Corporation

Continuation-in-part of application Ser. No. 779,274, Nov. 26, 1968, which is a continuation-in-part of application Ser. No. 760,665, Sept. 18, 1968. This application Mar. 21, 1969, Ser. No. 809,125
Int. Cl. B21b *27/06, 45/02*
U.S. Cl. 72—201 **31 Claims**

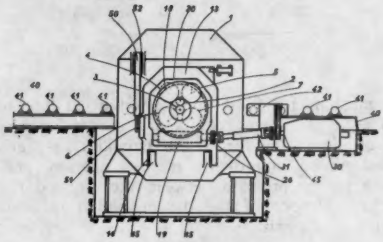


Ferrous metal workpieces are rolled at an elevated hot rolling temperature in a hot mill using an aqueous dispersion of an oily liquid as a coolant and lubricant for the work rolls of the rolling stands. The aqueous dispersion contains about 0.0005–0.05% by weight of an oily liquid having a high flash point which is capable of acting as a lubricant at the rolling temperatures and pressures. Preferred oily liquids include rapeseed oil and synthetic rapeseed oil. The oily liquid is injected under high pressure into a high-pressure water stream to form the dispersion and the dispersion is sprayed onto the work rolls. Flow of oily liquid is discontinued before the workpiece leaves the mill, for the tail end portion of the hot workpiece to remove oil on the rolls to avoid slippage when the next workpiece enters the roll bite. Flow of oily liquid is initiated only after the workpiece enters the roll bite.

3,605,474
ROLLING MILL DRIVE SYSTEM

Bernard Lhenry, Le Creusot, France, assignor to Creusot-Loire, Paris, France

Filed June 3, 1969, Ser. No. 830,022
Claims priority, application France, Nov. 15, 1968, 173,991
Int. Cl. B21b *35/00*
U.S. Cl. 72—249 **3 Claims**

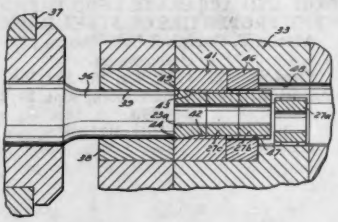


A rolling mill stand having a pair of small diameter work rolls each bearing against back-up rolls, each work roll being coupled to a drive mechanism therefor, the drive mechanisms being synchronised and being on opposite sides of the stand.

3,605,475
METHOD AND APPARATUS FOR EXTRUDING GEAR BLANKS

Gerald R. Eakin and George T. Payne, Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

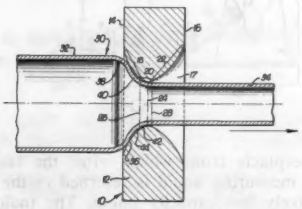
Filed June 19, 1969, Ser. No. 834,672
Int. Cl. B21c *23/14, 25/02*
U.S. Cl. 72—256 **18 Claims**



A forged blank for forming helical gears is disclosed. The blank is provided with shallow helical timing grooves formed by pressing the blank through an extrusion die having inwardly projecting helical teeth. The material displaced to form the groove flows inwardly toward an axial passage through the blank. The apparatus for forming the

blank includes a non-rotating punch formed with a planar end face and a die assembly including a portion formed with inwardly extending helical teeth. The blank rotates around its axis and relative to the punch as it moves through the extrusion die. The punch does not enter the toothed portion of the die and a subsequent blank is utilized to press the preceding blank through the die. The blank is radially confined before extrusion loads are applied thereto and the end face of the blank is fully supported by the punch or a subsequent blank.

3,605,476
METAL DRAWING METHOD AND APPARATUS
John W. Hinshaw, Garden Grove, Calif., assignor to Battelle Development Corporation, Columbus, Ohio
Filed Feb. 17, 1969, Ser. No. 799,605
Int. Cl. B21c *1/00, 3/00*
U.S. Cl. 72—274 **27 Claims**

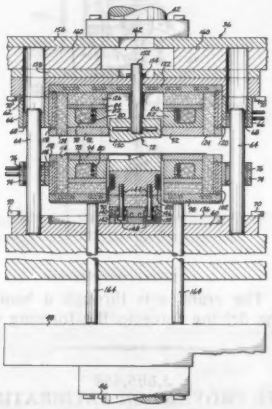


A method of drawing elongated metal articles and a novel die configuration which implements the method, assuring the establishment and optimum performance thereof. According to the invention, tube, bar, rod or sheet stock is drawn to a reduced diameter or wall thickness, or both, through the die or between the die and a mandrel or other supporting surface. The die in longitudinal section has entrance and land arcs, preferably segments of circles, which intersect with a common tangent, and has an outwardly flaring exit that is preferably an arc tangential with the land arc. The stock upon entering the die is deflected inwardly or laterally a large amount at a primary deflection point on the entrance arc, to be intercepted and further deflected a small, precisely controlled amount at a secondary deflection point on the land arc, thereby creating and perpetuating a natural serpentine bend in the stock as it moves under the die, greatly reducing redundant work and friction and providing a lubrication chamber between stock and die for improved lubrication, whereby the required drawing force is substantially reduced, and producing more uniform final dimensions, as well as improved quality of the material, both internally and externally.

3,605,477
PRECISION FORMING OF TITANIUM ALLOYS AND THE LIKE BY USE OF INDUCTION HEATING
Arne H. Carlson, Seattle, Wash., assignor to Arne H. Carlson and S. P. Ozbolt, both of Renton, Wash.
Filed Feb. 2, 1968, Ser. No. 702,700
Int. Cl. B21d *37/16*
U.S. Cl. 72—342 **10 Claims**

Titanium alloy blanks or the like are successively coated with a high temperature lubricant; preheated in a preheat oven to a forming temperature (about 1000–1500° F.); precision formed into a desired shape in a press which includes inductively heated forming tools, serving to maintain the metal at the forming temperature throughout the forming operation; and slowly cooled, first in a postheat oven down to a lower elevated temperature (e.g. about 600° F.) and then under cover of an asbestos blanket down to ambient temperature.

The heat forming tools include a fixed die, a movable die and a movable clamping pad. The movable tools are mounted for precision movement by leader pins and bushings. Insulation and water jackets are interposed between the heated tools and the leader pins and bushings

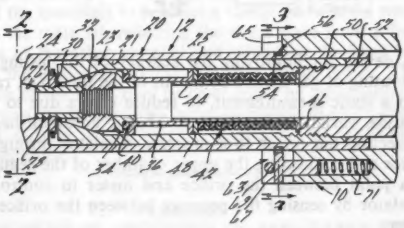


to prevent harmful heating of the latter. The forming tools comprise water cooled tubular conductors embedded in insulative material which in turn is embedded in ferromagnetic cores, and die parts of long life metals on which the forming surfaces are machined.

ERRATUM

For Class 72—345 see:
Patent No. 3,605,499

3,605,478
INTEGRAL ANVIL HOLDER
Peter R. Chirco, Utica, Mich., assignor to Huck Manufacturing Company, Detroit, Mich.
Filed Sept. 9, 1968, Ser. No. 758,468
Int. Cl. B21d *9/05*
U.S. Cl. 72—391 **9 Claims**

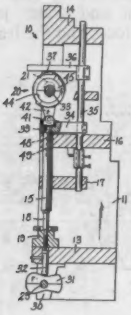


An anvil construction for a tool for setting fasteners with the anvil having a pair of diametrically opposed flats for clearance purposes and including means for attaching the anvil to the tool whereby the anvil can be rotated to move the flats into any desired position.

3,605,479
FORMING PRESS
Charles Robert Bradlee, Cheshire, Conn., assignor to Textron, Inc., Providence, R.I.
Filed May 8, 1968, Ser. No. 727,404
Int. Cl. B21j *9/18*
U.S. Cl. 72—450 **15 Claims**

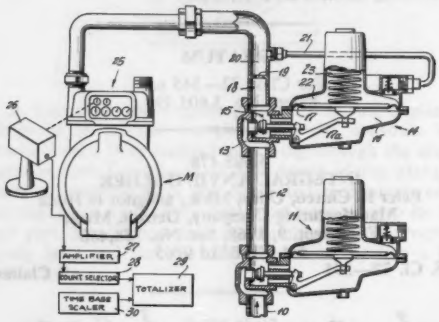
A forming press in which the forming elements are driven by a crank and connecting rod. The connecting

rod is directly driven in a forming stroke by a crank and subsequently operates a lifting cam carried on the same



drive shaft. The crank acts through a bearing or slide to impart the driving force to the forming elements.

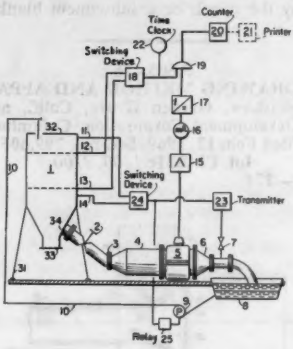
3,605,480
GAS METER PROVING OR CALIBRATING MEANS
Theodore A. St. Clair, Fairfield, Conn., assignor to Textron, Inc., Providence, R.I.
Filed Feb. 4, 1970, Ser. No. 8,469
Int. Cl. G01f *25/00*
U.S. Cl. 73—3 **2 Claims**



A device for improving the acuracy of the testing and calibrating of gas meters by means of the flow rate, rather than a static measurement, to reduce errors due to temperature variations in the gas. This is accomplished by connecting the meter to a pressure regulator through an orifice and connecting the upper chamber of the regulator to a point between the orifice and meter to control the regulator by sensing the pressure between the orifice and meter.

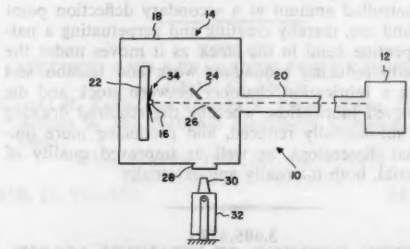
3,605,481
MEASURING THE ACCURACY OF FLOW VOLUME METERS
Walter Basler, Basel, Switzerland, assignor to Firma Rheometron G.m.b.H., Basel, Switzerland
Filed Oct. 21, 1969, Ser. No. 868,084
Claims priority, application Germany, Oct. 28, 1968, P 18 05 605.8
Int. Cl. G01f *25/00*
U.S. Cl. 73—3 **9 Claims**

The accuracy for the purpose of calibration of flow volume meters, having flow rate indicators, is measured by providing a column of measuring liquid and delivering a certain or limited volume of the liquid, by gravity flow, from the column to the meter to be tested. The flow flows through the meter at a flow rate which decreases with the decrease in height of the column. During the flow of liquid the flow rate is measured by suitable means, and this actual flow rate is compared with the flow rate indicated by the rate indicator of the meter. An elevated gravity flow container is provided for the column of liquid and its outlet is connected, through a shut-off valve to the meter, with the meter discharge emptying into a



suitable receptacle from which, after the test is completed, the measuring liquid is returned to the container by a relatively low capacity pump. The indicated flow rate of the meter preferably is integrated, and additional liquid level detectors initiate and terminate the flow of liquid through the meter. Vertically spaced level detectors in the container initiate and terminate the time measurement.

3,605,482
IMPACT MEASURING TECHNIQUE
Donald H. Humes, Hampton, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Nov. 26, 1968, Ser. No. 779,160
Int. Cl. G01l *5/14*
U.S. Cl. 73—12 **6 Claims**

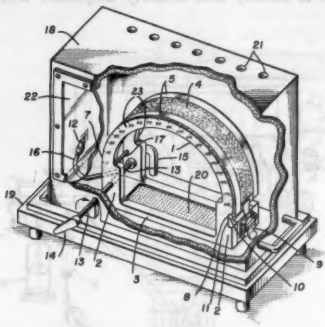


This disclosure relates to a method of measuring the size of hypervelocity projectiles at the time of impact upon a target. This is accomplished by photographing the silhouetted image formed of the projectile by the impact flash along a line of view at a small angle from its line of flight.

3,605,483
FLAMMABILITY TEST APPARATUS
Eugene L. Ringwald, Cary, Mitchell T. Burden, Apex, and Henry L. King, Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 29, 1968, Ser. No. 771,476
Int. Cl. G01n *25/01*
U.S. Cl. 73—15 **9 Claims**

An apparatus for testing the flammability of a sheeted material comprised of a noninflammable bifurcated

semicircular frame with means for holding the sheeted material between the bifurcations and along the frame,



and means to ignite the sheeted material near one end of the frame.

3,605,484

METHOD AND APPARATUS TO DETERMINE CARBON POTENTIAL IN THE ATMOSPHERE OF TREATMENT FURNACES

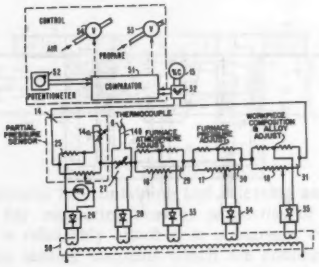
Joachim Wünning, 20 Bergstrasse, 7251 Warmbronn, Germany

Continuation-in-part of abandoned application Ser. No. 631,240, Apr. 17, 1967. This application Oct. 3, 1968, Ser. No. 784,496

Claims priority, application Germany, Apr. 21, 1966, W 41,390; Oct. 5, 1967, P 16 73 328.1

Int. Cl. G01n *7/00*

U.S. Cl. 73—23 **14 Claims**



An electrical signal representative of the logarithm of the partial pressure of the component in the furnace is derived and to this logarithmic signal an electrical signal directly responsive to temperature is added to provide for a temperature correction factor; other signals representative of other correction factors, for example to compensate for drift of measuring instruments, may be added; the composite signal is then indicative of the carbon potential of the atmosphere within the furnace.

3,605,485

MONITORING DUST CONCENTRATION

Stanislaw Badzioch and Peter G. W. Hawksley, London, England, assignors to Coal Industry (Patents) Limited, London, England

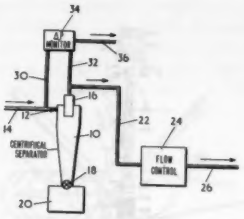
Filed May 8, 1970, Ser. No. 35,645

Claims priority, application Great Britain, May 16, 1969, 25,012/69

Int. Cl. B01d *45/12;* **G01n** *31/00*

U.S. Cl. 73—28 **10 Claims**

A method of monitoring dust includes passing a stream of gas containing dust into a centrifugal flow separating device. Whilst one characteristic of gas flow through the device is maintained constant and the dust concentration



in the device is allowed to increase, another characteristic of gas flow through the device is monitored.

3,605,486

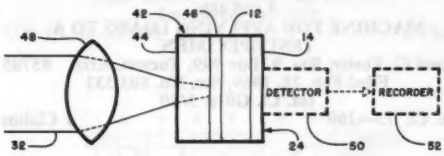
METHOD AND APPARATUS FOR MEASURING ADHESION OF MATERIAL BONDS

Nordin C. Anderholm and Albert Goodman, Albuquerque, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 21, 1970, Ser. No. 4,664

Int. Cl. G01n *3/30*

U.S. Cl. 73—95 **5 Claims**



Measuring adhesion of one material to another and tensile strength of the bond between these materials by producing a pulse of tensile stress in the materials and subjecting the bond to the tensile stress such as by impinging a pulse of radiant energy against a surface of one of the materials to produce a compressive stress wave within the material, reflecting the stress wave from a free surface of the other material and subjecting the bond between the materials to the reflected tensile wave. The strength of the bond may be determined by incrementally increasing the tensile stress wave amplitude to effect bond failure and the tensile strength determined by measuring this amplitude.

3,605,487

ALIGNMENT OF SPECIMEN IN APPARATUS FOR TESTING MATERIAL FOR RESISTANCE TO STRESS

Robert B. Corbett, Mars, Pa., assignor to Corbett Associates, Inc., Mars, Pa.

Original application June 21, 1965, Ser. No. 465,675. Divided and this application Oct. 31, 1969, Ser. No. 873,773

Int. Cl. G01n *3/08*

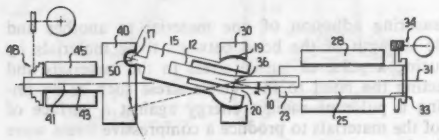
U.S. Cl. 73—95 **5 Claims**

There is disclosed testing apparatus for determining accurately the creep properties of material, such as hot-tensile creep or creep-rupture or stress-relaxation. The apparatus includes a train for applying axial force to a specimen **16**. The force is applied aligned along the specimen, with a deviation not exceeding 5 percent from alignment. The alignment is achieved by suspending the

specimen in the force-applying train from couplings **38** including bearings **300** assuring that the specimen is sus-

pended and supported by the bearings and not the threads **84** of the couplings.

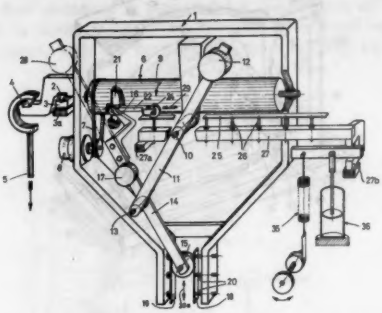
3,605,488
MACHINE FOR APPLYING LOADS TO A TEST SPECIMEN
Arland G. Foster, Rte. 9, Box 949, Tucson, Ariz. 85705
Filed Feb. 28, 1969, Ser. No. 803,333
Int. Cl. G01n *3/20*
U.S. Cl. 73—100 **4 Claims**



A test specimen is subjected to a pure bending load by applying to the specimen a rotating load transverse to the axis thereof, and holding the specimen against rotation during application of the rotating load while permitting the specimen to undergo wobble in reaction to the load. The specimen may also be subjected to axial loads (tension or compression) and torsional loading independently of one another and of the bending load, so that any combination of these loads may be applied to the specimen at will.

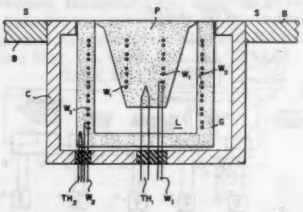
3,605,489
DYNAMOMETER FOR MEASURING FORCE, IN PARTICULAR A BEAM BALANCE
Werner Haack, Bondastrasse 83, CH–7000 Chur, Switzerland
Filed Dec. 12, 1969, Ser. No. 884,579
Claims priority, application Germany, Dec. 12, 1968, P 18 14 161.2
Int. Cl. G01l *1/08*
U.S. Cl. 73—141R **11 Claims**

A dynamometer comprising a beam balance having a motor-driven friction roller and a friction wheel in contact therewith, the wheel bearing via a guide bar against a rail extending parallel to the axis of the friction roller so that when a load is applied to the dynamometer the friction wheel is axially and linearly displaced with re-



spect to the friction roller until a new point of balance is reached. The parallel motion of the friction wheel alongside the friction roller is achieved by means of a drive mechanism consisting of articulated levers.

3,605,490
HEAT SENSOR
Richard Carl Progelhof, Berkeley Heights, and Gerald George Govesky, Elizabeth, N.J., assignors to American Standard Inc., New York, N.Y.
Filed Dec. 5, 1969, Ser. No. 882,795
Int. Cl. G01k *17/00*
U.S. Cl. 73—190H **8 Claims**

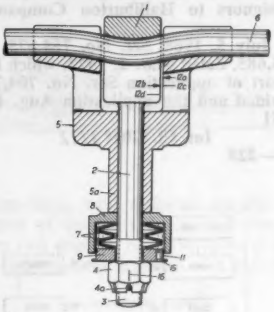


Covers a heat flux probe for observing or measuring the rate at which heat is dissipated to an external body or space. The probe includes two spaced units and a non-conductive case which confines both units except a face of one of the units which is to be exposed to the external body or space. Heat is supplied to both units so as to hold them continually at the same temperature.

3,605,491
CABLE CLAMP PARTICULARLY FOR CABLE CARS
Eduard Senn, Hungerburg 46, Innnsbruck, Austria
Filed July 29, 1968, Ser. No. 748,434
Int. Cl. G01l *1/04;* **B61b**
U.S. Cl. 73—141A **7 Claims**

A cable clamp, particularly for cable cars, comprising two clamping parts displaceable relative to each other. The clamping faces of the clamping parts being at least partly inclined to the axis of the cable and imparting to the cable a slight double S-curvature between the clamping parts, and a spring in the path of the clamping force

between the two clamping parts. Means for measuring the extent of the deformation of the spring and means

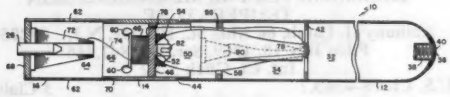


for measuring the extent of the relative displacement of the clamping parts are also provided.

3,605,492
PREASSEMBLED MODEL SXBT FLOTATION DEVICE

George D. Stohrer, John H. Cawley, Richard P. Berthiaume, and Daniel Schiff, Bowie, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Mar. 26, 1970, Ser. No. 22,939
Int. Cl. G01n *33/18, 1/00*
U.S. Cl. 73—170A **9 Claims**



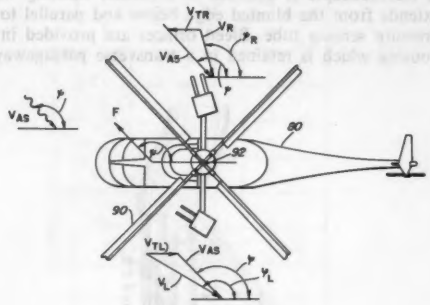
Apparatus for containing and releasing an expendable probe for measuring various properties of water. The probe is releasably attached to a buoyant cannister and contains sensing elements which are connected with instrumentation aboard a submerged launch vehicle.

3,605,493
DIRECTION AND VELOCITY DETERMINING APPARATUS

Victor B. Corey, Bellevue, Wash., assignor to United Control Corporation

Original application Mar. 24, 1969, Ser. No. 809,837. Divided and this application June 29, 1970, Ser. No. 50,369
Int. Cl. G01c *23/00*
U.S. Cl. 73—181 **5 Claims**

Detection apparatus for determining the direction and velocity of an incident fluid flow stream. A sonic vibration producing means axially spaced from a sonic vibration detection means is oriented parallel to the direction of flow of the incident fluid flow stream by servo means in order to determine the direction of fluid flow. A second sonic vibration producing means axially spaced from a second sonic detection means and having a common axis at 90° relative to the common axis of the first mentioned means is relatively moved by servo means to indicate velocity of fluid flow. The velocity and direction of flight of a helicopter are indicated by a pair of the above means

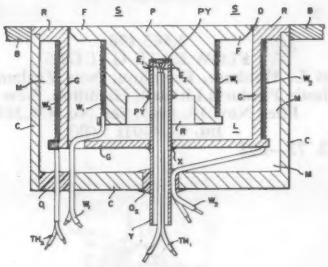


using circuits which combine the signal outputs to eliminate rotor produced disturbances.

3,605,494
HEAT FLOW CALORIMETER

Richard Carl Progelhof, Berkeley Heights, and Norman Zethward Shilling, Lyndhurst, N.J., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,581
Int. Cl. G01k *17/00*
U.S. Cl. 73—190H **8 Claims**



Covers a heat flux probe for measuring or determining the dissipation of heat to an external body or surface. The probe includes two coaxial cylindrical conductive units and a non-conductive housing which may also be coaxial with the two units, the housing exposing one face or side of the innermost unit to the external body or surface. Both units have peripheral heating coils which receive currents to maintain both units at a common temperature. Both units are supported by a common non-conductive member.

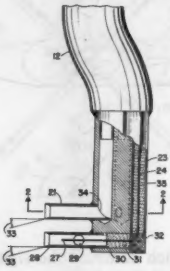
3,605,495
SENSING PROBE

Lloyd N. Krause, Westlake, and George E. Glawe, Berea, Ohio, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 29, 1969, Ser. No. 861,649
Int. Cl. G01k *13/02*
U.S. Cl. 73—198 **9 Claims**

A probe having a sensing head in the form of a blunted wedge with flat sides. An orifice is provided in each wedge

face and communicates with a respective longitudinal passageway in the sensing head. A total pressure sensing tube extends from the blunted edge and communicates with another longitudinal passageway in the sensing head. A thermocouple is disposed in a tubular housing which extends from the blunted edge below and parallel to the pressure sensing tube. Bleed orifices are provided in the housing which is retained in a transverse passageway in



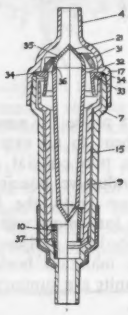
the sensing head. A longitudinal groove is formed in the rear surface of the sensing head to contain a conduit for thermocouple leads which are directed to the thermocouple through a ceramic plug in the transverse passage. A cementitious material is used to fill the groove below the thermocouple conduit. The leads in the thermocouple conduit are surrounded by a ceramic material which has been swaged into the conduit.

3,605,496

FLOW RATE GAUGES

Douglas L. Wenham, Hamilton, New Zealand, assignor to Plastic Products Limited, Hamilton, New Zealand

Filed Nov. 10, 1969, Ser. No. 875,385
Int. Cl. G01f *5/00*
U.S. Cl. 73—202 **5 Claims**



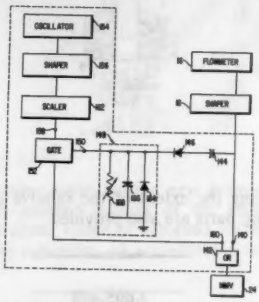
A flow rate gauge has a cylindrical body used vertically with a lower inlet and an upper outlet, a restriction to flow in the body and a liquid bypass bypassing the flow restricting means and including a sight glass, the level of liquid rising in the bypass indicating the rate of flow of liquid through the gauge. A non-return valve is provided to prevent the return flow of liquid and movable tubes within the body move when the gauge is laid on its side to permit cleaning liquid to pass through the bypass.

3,605,497

FLOWMETER BEARING FRICTION COMPENSATING METHOD AND SYSTEM

Carl W. Zimmerman and George V. Copland, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Application July 5, 1968, Ser. No. 750,675, now Patent No. 3,566,685, dated Mar. 2, 1971, which is a continuation-in-part of application Ser. No. 704,703, Feb. 9, 1968. Divided and this application Aug. 4, 1970, Ser. No. 60,851
Int. Cl. G01f *1/12*
U.S. Cl. 73—229 **5 Claims**



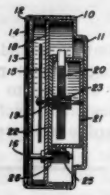
A flowmeter bearing friction compensating method and circuit for use in a fluid flow metering system using digital signals and logic for producing a compensated manifestation of fluid flow. Means are provided to prevent the generation of compensating pulses in the absence of fluid flow.

3,605,498

THERMOMETER FOR MEASURING SKIN TEMPERATURE

Anthony H. Lamb, 66 King St., Hillside, N.J. 07205

Filed July 18, 1969, Ser. No. 842,866
Int. Cl. G01k *5/62*
U.S. Cl. 73—363.7 **3 Claims**



A bi-metallic thermometer particularly adapted for the measurement of the temperature of a selected area of the skin. The thermometer is affixed to the skin and the position of the pointer is adjusted relative to the scale by a screw-pinion arrangement while the thermometer is so affixed.

3,605,499

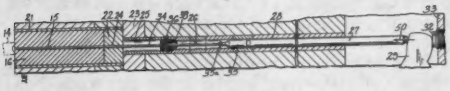
MECHANISM FOR EJECTING WORKPIECES FROM A DIE

Anthony M. Putetti, Waterbury, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 22, 1969, Ser. No. 818,303
Int. Cl. B21d *45/00*
U.S. Cl. 72—345 **8 Claims**

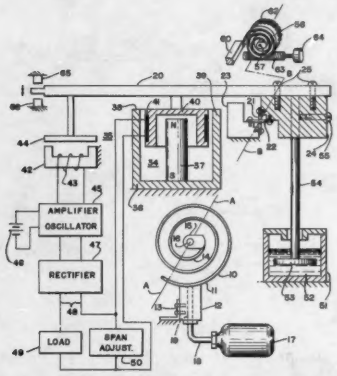
A knockout mechanism for ejecting workpieces from a die which comprises a knockout pin slidably mounted

in the die and slidably supported in a bore in the frame therefor, the knockout pin cooperating with a sleeve member having at least one arm pivotally mounted there-



on and cooperating with a flange on the end of the forward section of the pin such that the end of the arm can pass over and grip the flange in order that the sleeve member be slidably retracted with said knockout pin.

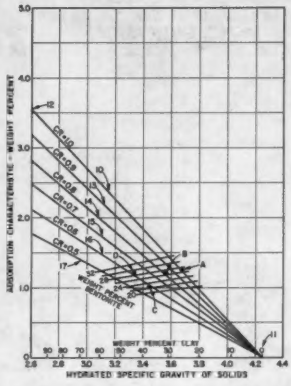
3,605,500
PRESSURE TRANSDUCER
Harold E. Trekell, Wakefield, Mass., assignor to General Electric Company
Filed Oct. 27, 1969, Ser. No. 869,739
Int. Cl. G01l *9/00, 7/04*
U.S. Cl. 73—398R **9 Claims**



A pressure transducer using a Bourdon tube producing an output signal variable with input pressure. Measurement errors due to nonlinear elastic properties of the tube are largely eliminated by imposing lateral and rotary restraints on the deflection end of the tube with a force balance lever system. Stops limit movement of the lever system beyond the normal measurement range and thus prevent excessive deflection and stress of the tube in the event of overpressure. Differential or absolute pressure may be conveniently measured by the addition of a second Bourdon tube connected in opposed relation to the first tube.

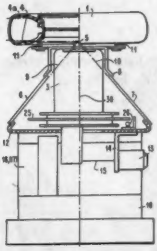
3,605,501
METHOD FOR DETERMINING CLAY REACTIVITY
Martin E. Chenevert, Houston, Tex., assignor to Esso Production Research Company
Filed Mar. 16, 1970, Ser. No. 20,003
Int. Cl. G01n *25/56*
U.S. Cl. 73—432 **10 Claims**

The capacity of a dehydrated drilling fluid sample to adsorb water under a fixed humidity environment is determined and compared to the capacity of a dehydrated standard material to adsorb water under the same environ-



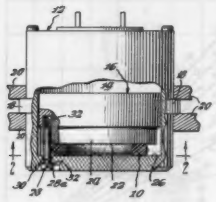
ment. The ratio expresses the reactivity of the clay as related to the standard material.

3,605,502
BALANCING MACHINE
Heinrich Hack, Spachbrucken, Germany, assignor to Carl Schenck Maschinenfabrik G.m.b.H., Darmstadt, Germany
Filed Mar. 12, 1969, Ser. No. 806,621
Claims priority, application Germany, Mar. 12, 1968, P 16 98 164.9
Int. Cl. G01m *1/22*
U.S. Cl. 73—471 **6 Claims**



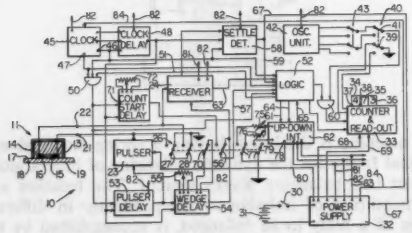
A machine is disclosed, having a spring-mounted mechanical frame for the dynamic balancing of bodies along at least two balancing planes thereof. The location and the measuring of imbalances independently in different planes of a body to be balanced, is accomplished by the provision of at least two sets of spring assemblies, wherein one spring assembly is disposed parallel to the rotational axis of the body to be balanced, permitting the parallel displacement of the axis, and the second assembly contains at least two elongated springs disposed with the extensions of their longitudinal axes intersecting in a given balancing plane of the body. Suitably each spring assembly contains leaf springs, torsion bars, or the like resilient members. When leaf springs are used, a pair of springs is disposed parallel to the rotational axis, and is suitably disposed at 90° from the position of a pair of springs inclined toward one another and the extensions of their longitudinal axes intersecting each other to bring about a corresponding 90° shift in the measurement of the oscillations caused by the imbalances in the different balancing planes.

3,605,503
TRANSDUCER ALIGNMENT MEANS
Jack A. Morrow, Bellevue, Wash., assignor to United Control Corporation
Filed Aug. 28, 1969, Ser. No. 853,805
Int. Cl. G01p *15/08*
U.S. Cl. 73—517R **14 Claims**



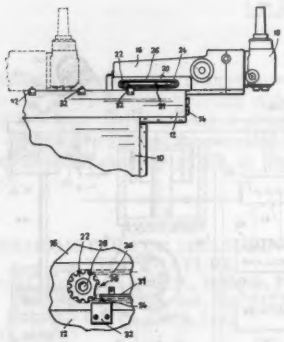
A means for aligning an accelerometer or other transducer relative to a support structure wherein the transducer and the support structure have opposed, spaced, generally planar surfaces. A resilient member is sandwiched between the surfaces and three threaded bolt members extend through openings in the support member at equally spaced points and are threaded into openings in an exterior portion of the transducer. The resilient member may be an elastic O-ring, a metallic elastic washer, or other elastic structure. Tightening of the bolt members for alignment purposes moves the transducer toward the support structure and compresses the resilient member. The opposed forces between the compressed resilient member and the tightened bolt members stabilize the transducer in its aligned position relative to the support structure.

3,605,504
ULTRASONIC THICKNESS MEASURING SYSTEM
George L. Kummer, Jr., Mount Prospect, Ronald A. Straw, Aurora, and John A. Wendt, Park Ridge, Ill., assignors to Magnaflux Corporation, Chicago, Ill.
Filed Feb. 28, 1969, Ser. No. 803,165
Int. Cl. G01b *17/02*
U.S. Cl. 73—67.7 **19 Claims**



Ultrasonic thickness measuring system in which bursts of ultrasonic energy are transmitted into a front surface of a part with received signals being developed from reflections from the back surface of a part, the time interval between a transmitted burst and a corresponding received signal being measured electronically, preferably by digital means. An important feature is in the provision of means for automatically controlling the gain of an amplifier to develop amplified received signals of constant amplitude in response to back reflections of varying amplitude which permits much more accurate measurement. Another important feature is in the provision of an integrator for producing a control signal having a duration directly proportional to and at least several times larger than the time interval between a burst and the corresponding reflection, which permits much more accurate measurement with a practical design of time measuring means. The integrator may comprise a means for charging a capacitor at a uniform rate during the time interval between a burst and the corresponding reflection and for discharging the capacitor at a uniform but much slower rate. A further feature relates to the operation of the time interval measuring means periodically at a slow rate such that the maximum duration of the time interval measured is a small fraction of the time between operations of the measuring means, which conserves power and is otherwise advantageous.

3,605,505
DEVICE FOR MOVING HEAVY MACHINE PARTS IN THEIR GUIDE
Leonhard Gschwendtner, Munich, Germany, assignor to Friedrich Deckel Prazisions Mechanik & Maschinenbau, Munich, Germany
Filed May 23, 1969, Ser. No. 827,311
Claims priority, application Austria, June 4, 1968, A 5,314/68
Int. Cl. F16h *19/06*
U.S. Cl. 74—37 **2 Claims**

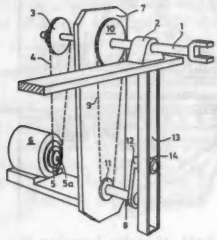


A device for permitting controlled relative movement between machine parts, particularly between a worktool spindle support member and its associated guideway. One of the parts is provided with an endless chain thereon, one reach of the chain being in driving engagement with a catch lug fixedly secured to the other part. The other part is preferably provided with a plurality of spaced catch lugs therealong adapted to intermittently engage the chain whereby the one part can be linearly moved relative to the other part through a distance substantially greater than the longitudinal length of the one reach of the chain.

3,605,506
DEVICE FOR OBTAINING A ROTATING MOTION WITH PERIODICALLY ALTERNATING INCREASING AND DECREASING ANGULAR VELOCITY
Kaspar Kuster, Basel, Switzerland, assignor to Willy A. Bachofen, Basel, Switzerland
Filed Sept. 23, 1969, Ser. No. 860,327
Claims priority, application Switzerland, Sept. 23, 1968, 14,189/68
Int. Cl. F16h *21/12*
U.S. Cl. 74—63 **6 Claims**

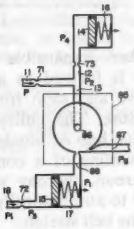
A device for producing a rotating motion with periodically alternating increasing and decreasing angular velocity includes a pendulum pivotally mounted on a driven shaft of the device and carrying a control member which

is positively coupled to the driven shaft and which cooperates with a fixed point of the device to cause a periodic



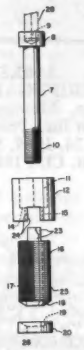
swinging movement of the pendulum dependent on the speed of the driven shaft.

3,605,507
AUTOMATIC TRANSMISSION
Tomoo Ishihara, Tokyo, Katsuya Suzuki, Nagoya, and Hajime Arai, Hisaji Nishikawa, and Shin Ito, Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Toyota-shi, Aichi-ken, Japan
Filed Apr. 10, 1969, Ser. No. 815,070
Claims priority, application Japan, May 28, 1968, 43/35,689
Int. Cl. F15b *15/22;* **F16d** *67/04;* **F16h** *57/10*
U.S. Cl. 74—761 **4 Claims**



In general, in a fluid automatic transmission composed of a torque converter and a planetary gear system provided with a multiple disc clutch and a brake band, when the vehicle is running in drive range it is unable to avoid shock given to the driver at the time of automatic gear change for up-shift or down-shift of speed. The control system according to the present invention is intended to prevent occurrence of the above shock which gives the driver an uncomfortable feeling or uneasiness by means of comparatively simple methods. That is, a pure fluid element, for instance, a fluid amplifier is provided on one or both of the pipe-lines for applying or relieving hydraulic pressure to the multiple disc clutch servo piston and to the brake band servo piston and by utilizing the different resistance characteristics of this pure fluid element in the forward and reverse directions of the pressure oil, a difference of time constant is produced between engaging and disengaging of the clutch and the brake band, whereby it is contemplated that the multiple disc clutch is slowly engaged for shifting up the speed after the brake band has been disengaged and the brake band is slowly engaged for shifting down the speed after the multiple disc clutch has been disengaged, thus reducing the shock at time of automatic gear change to minimum. Moreover, the present invention contemplates that the governor pressure having relation to the vehicle speed is applied to the control port of said fluid amplifier and a difference of the shock at time of automatic gear change caused between high speed and low speed at which the vehicle is running in the drive range is also eliminated, so that a more comfortable and almost shockless automatic gear change can be accomplished.

3,605,508
PRECISION THREADED ADJUSTMENT
William B. Fell, 320 McLain Ave., Rockford, Ill. 61102
Filed June 23, 1969, Ser. No. 835,477
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **5 Claims**

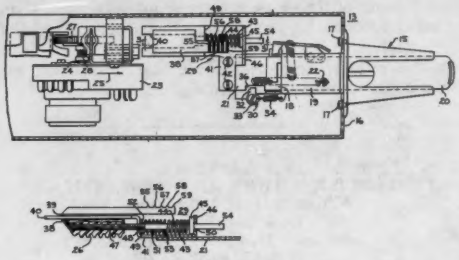


A hollow adjusting screw threads in a hole provided in one of two members and has a lost motion connection with a hollow adjusting head bearing on an annular shoulder at the upper end of the hole, this head having a hold-down screw extending through it and the first named screw and threading in a hole provided in the other member on which the lower end of the first named screw seats on a suitable washer. The head on the hold-down screw bears on an annular shoulder in the adjusting head and clamps the two members together. The adjusting screw and the hold-down screw have the same number of threads per inch but of opposite hand so after the members are roughtly adjusted by means of the adjusting head and adjusting screw to approximately the desired extent and the hold-down screw is tightened enough to insure its turning with the adjusting screw, any fine adjustment thereafter of the adjusting screw with the adjusting head results in the hold-down screw turning with the other parts without disturbing the clamping action.

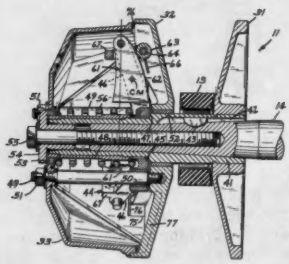
3,605,509
LOST MOTION MECHANISM FOR COIN-OPERATED TIMER RUN TIME ACCUMULATOR
Robert D. Harris, Sr., Louisville, Ky., assignor to General Electric Company
Filed May 1, 1969, Ser. No. 820,907
Int. Cl. F16h *27/02;* **G07f** *5/00*
U.S. Cl. 74—130 **7 Claims**

A lost motion mechanism is provided for use in conjunction with a time accumulating means adapted to accumulate timer run time on a timer mechanism in response to an outward reciprocation of the slide of a coin-receiving mechanism from a fully inward position. The

lost motion mechanism is associated with the slide to delay the operation of the time accumulating means during the initial outward reciprocation of the slide from the fully inward position.



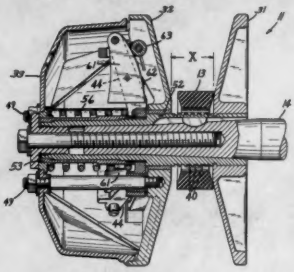
3,605,510
CENTRIFUGAL CLUTCH
Eugene W. Laughlin, Minneapolis, Minn., assignor to Textron Inc., Providence, R.I.
Filed Oct. 24, 1969, Ser. No. 869,165
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **16 Claims**



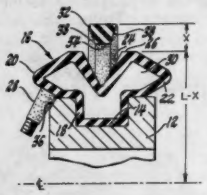
The disclosure is directed to a variable ratio centrifugal clutch having driving and driven assemblies connected by an endless belt. The driving assembly consists of a pair of sheaves affixed to a drive shaft, one being axially stationary and the other being axially movable with respect thereto. The movable sheave forms part of a closed housing which fully encloses a plurality of flyweights pivotally mounted on the shaft for rotation therewith. In response to increases in drive shaft speed, the flyweights swing outward and engage the housing, moving it in its entirety along the shaft to bring the sheaves together.

3,605,511
SELF-CLEANING CENTRIFUGAL CLUTCH
Clement F. Deschene, Roseau, Minn., assignor to Textron Inc., Providence, R.I.
Filed Oct. 24, 1969, Ser. No. 869,167
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **5 Claims**

A self-cleaning centrifugal clutch is disclosed that consists of driving and driven assemblies operatively connected by an endless rubber belt. The driving assembly includes a pair of sheaves affixed to a rotatable shaft, one of the sheaves being axially movable with respect to the other to control radial position of the belt on the sheaves and thereby effect a variable revolution ratio between the driving and driven assemblies. That portion of the shaft over which the movable sheave rides is formed with a plurality of circumferential grooves which prevent the buildup of burned rubber transferred from the belt to the shaft, thereby keeping the shaft clean and maintaining proper operation.

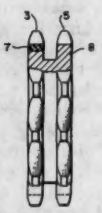


3,605,512
EXPANSIBLE PULLEY
John J. Wetzel II, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 20, 1969, Ser. No. 867,846
Int. Cl. F16h *55/54*
U.S. Cl. 74—230.18 **8 Claims**



A molded rubber expansible pulley arrangement wherein the pulley is formed as a shaped endless tube and includes a valve and stem for filling the tube to a predetermined pressure. The pulley may be mounted in a groove on the drive hub or bonded thereto and is compressed for the mounting of a conventional V-belt in a groove formed thereon, thereby serving to continually tension the belt and to automatically continue the tensioning process should the belt stretch.

3,605,513
MULTIPLE CONTACT SPROCKETS
Yoshiaki Sugimoto, Tokorozawa, Saitama Prefecture, Japan, assignor to The Tsubakimoto Chain Mfg. Co., Ltd., Osaka, Japan
Filed Sept. 8, 1969, Ser. No. 856,059
Claims priority, application Japan, Sept. 17, 1968, 43/67,115, 43/67,116
Int. Cl. F16h *55/14, 55/18, 55/30*
U.S. Cl. 74—243PC **10 Claims**



A sprocket wheel having two surfaces of contact for contacting the same roller of sprocket chain. One of the

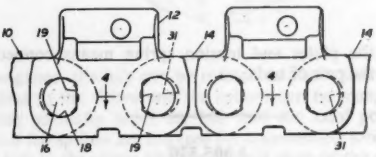
contact surfaces consists of an elastic material and contacts the roller before the other contact surfaces. This is because the one contact surface either is out of phase with the other contact surface or has a larger bottom diameter than the other contact surface. A chain drive system uses a driving wheel having one row of sprockets forwardly out of phase of another row and a driven wheel having one row of sprockets rearwardly out of phase with another row.

3,605,514

CUTTER CHAIN AND METHOD OF ASSEMBLY

Ralph W. Mitchell, % Wheeling Franklin Motel, 1421 Liberty St., Franklin, Pa. 16323

Filed Apr. 2, 1969, Ser. No. 812,760
Int. Cl. F16g *13/02*
U.S. Cl. 74—254 5 Claims



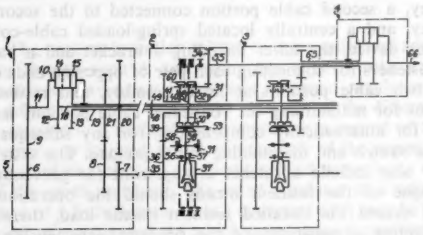
A cutter chain and method of assembly therefor employing pintles having portions non-rotatively retained within cutter carrying links and a recessed central portion along one side to allow space for greater than normal sprocket tooth size relative to a given pitch length.

3,605,515

VARIABLE-RATIO POSITIVE-DRIVE TRANSMISSION

Robert Eugène Jules Lecavelier, Paris, and Jean Tubeuf, Ville-d'Avray, France, assignors to Societe Anonyme dite: Societe d'Etude de la Propulsion par Reaction, Puteaux, France

Filed July 29, 1969, Ser. No. 845,708
Claims priority, application France, July 31, 1968, 161,415
Int. Cl. F16h *3/00, 35/02, 55/04*
U.S. Cl. 74—393 3 Claims



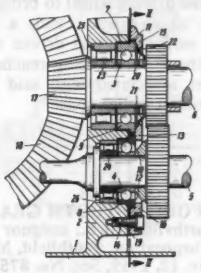
A variable speed positive-drive power transmission includes a power group of gears and at least two coupling groups, both of which are coupled to the power groups. The power groups each include a primary input shaft and at least two oscillatory shafts. The oscillatory shafts operate with periodic speed variations and therefore have variable reduction ratios in relation to the primary shaft of the group. Each coupling group has a secondary shaft and each secondary shaft is coupled to motion transfer points of the power groups. The transmission is intended for use with lathes and other machine tools where variable oscillatory speeds are required.

3,605,516

BEARING FOR THE SHAFTS OF A POWER TRANSMISSION COMBINED WITH A DIFFERENTIAL GEAR, ESPECIALLY FOR AUTOMOTIVE VEHICLES

Otto Hausinger, Gerlingen, Germany, assignor to Firma Dr.-Ing. h.c.F. Porsche K.G., Stuttgart-Zuffenhausen, Germany

Filed Mar. 13, 1970, Ser. No. 19,398
Claims priority, application Germany, Mar. 18, 1969, P 19 13 562.7
Int. Cl. F16c *21/00;* F16h *35/08*
U.S. Cl. 74—401 31 Claims



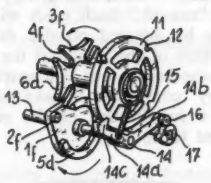
Bearing for the shafts of a change speed gear combined with a differential gear, especially for automotive vehicles, with several gear shafts disposed in adjacent relationship such as side-by-side or one above the other. The drive pinion of the crown wheel is fixedly connected to the gear output shaft of the change speed gear. The output shaft is supported in a radial ball bearing fashioned as a sliding bearing and in an axial bearing fashioned as a fixed bearing in a partition of the transmission case. Axial adjustment of the drive pinion is effected by shims.

3,605,517

IMMEDIATE LOCKING OR STALLING GENEVA WHEEL DEVICE HAVING A HIGH POSITIONING DEGREE OR INDEX FOR THE INTERMITTENT MEMBER BY A PLURALITY OF LOCKING OR STALLING PARTS (CENTERING ELEMENTS)

Ariosto Seragnoli, Bologna, Italy, assignor to G.D. Societa in Accomandita Semplice di Enzo Seragnolie, Bologna, Italy

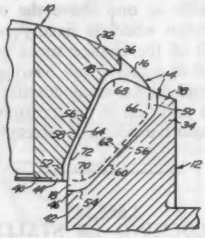
Filed July 17, 1969, Ser. No. 842,573
Int. Cl. F16h *55/04;* B23b *29/24*
U.S. Cl. 74—436 3 Claims



A Geneva wheel device comprises an evenly rotating driving wheel and a Geneva or driven wheel having radial spaces and being intermittently rotated by one or by each of a plurality of associated operating rollers, eccentrically angularly spaced apart with respect to said driving wheel. One or more cylindrical surface projections concentric (centering element) therewith and intended to co-operate

with one of the concave surfaces conjugated thereto on the Geneva wheel periphery between one space and the other are provided. Said operating roller(s) are associated with the driving wheel so as to enter the corresponding radial space at the intersection between the paths as described by the respective circumferential travel and that of the terminal ends of said Geneva wheel, the corresponding radial forming with the median radial of said entering space an angle less than 90°. There is provided a moving member having at least one auxiliary cylindrical surface (centering element) conjugable with the peripheral concave surfaces of the Geneva or driven wheel, this moving member being moved in timed relationship with the movements of the driving wheel to bring said auxiliary cylindrical surface to co-operate with a corresponding conjugate concave surface of said driven wheel so as to lock or stop it at the position being reached at the time the operating roller associated with said driving wheel leaves its corresponding radial space.

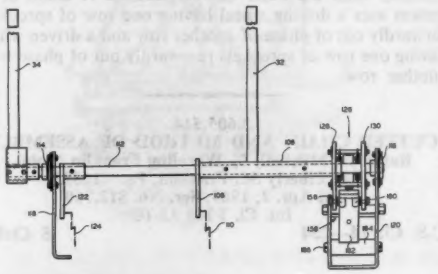
3,605,518
REINFORCED-TOOTH GEAR
John Haller, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Filed Nov. 12, 1969, Ser. No. 875,974
Int. Cl. F16h *55/04*; B21d *53/28*
U.S. Cl. 74—459.5 **8 Claims**



The roots of the teeth of a gear are interconnected at either or both of their opposite ends by reinforcement portions consisting of ribs extending between adjacent teeth and projecting outward from the bottoms of the spaces therebetween. The intermediate portions of the teeth of the gear have running contact and engagement between the reinforcement ribs at either or both ends of a similarly-reinforced meshing gear, so that the ribs strengthen the teeth without interfering with their rolling engagement or "run-off." Such gears with rib-connected teeth are made by sintered powder metallurgy as the outward projection of the ribs into the spaces between the teeth from the bottoms of said spaces prevents their manufacture by conventional gear-forming processes which require a run-through of the gear-forming tool between adjacent teeth.

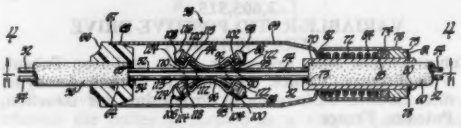
3,605,519
CONTROL FOR DUAL HYDROSTATIC DRIVE
John P. Heggen, Lisbon, N. Dak., assignor to Clark Equipment Company
Filed Jan. 26, 1970, Ser. No. 5,459
Int. Cl. G05g *13/00*
U.S. Cl. 74—480R **8 Claims**

Mechanism for controlling two separate power outputs together or independently, including a pair of plates mounted for rotation, a pair of converging slots in each plate, a rod extending through each pair of corresponding



slots in the plates and tension spring means connected between the pair of rods.

3,605,520
CABLE TRANSMISSION CONTROL
Harald H. Lorenz, Bloomfield Hills, and Roy S. Cataldo, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 9, 1970, Ser. No. 9,861
Int. Cl. F16c *1/22*
U.S. Cl. 74—501.5R **13 Claims**

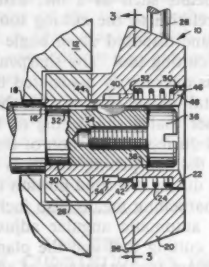


A shift control system having a first pulley operative in response to movement of a shift-selector mechanism, a second pulley operatively connected to an automatic transmission, a first cable portion connected to the first pulley, a second cable portion connected to the second pulley, and a centrally located spring-loaded cable-connector device, the latter including a bracket and a pair of fasteners for connecting each pair of opposing ends of the two cable portions at final assembly, and resilient means for maintaining the connected cable portions taut and for automatically compensating for any subsequent cable stretch and maintaining initial preload. The system may also include a ratchet arrangement for preventing collapse of the resilient means should the operational load exceed the installed resilient means load, thereby preventing a possibility of the operator experiencing a "spongy" pedal reaction.

3,605,521
INDEXING HANDLE FOR A TOOL
Charles A. Glenn, 92 Four Mile Road, West Hartford, Conn. 06107
Filed Mar. 26, 1970, Ser. No. 22,971
Int. Cl. G05g *1/04*
U.S. Cl. 74—548 **10 Claims**

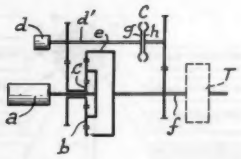
A tool handle capable of being indexed while mounted on a machine tool. The handle may be mounted to machines such as drill presses or milling machines which have a quill that is advanced manually by rotation of the

handle. The handle includes a hub which is manually rotated and a sleeve which is mounted to a rotatable control shaft in the machine. The sleeve and hub have mating splines and may be axially displaced with respect to one another to disengage the splines. When the splines are



disengaged, the hub can be rotated to a new position with respect to the sleeve and the splines can be reengaged. A spring normally urges the hub into the axial position at which the splines are engaged for transmitting torque from the hub to the sleeve and the control shaft of the machine.

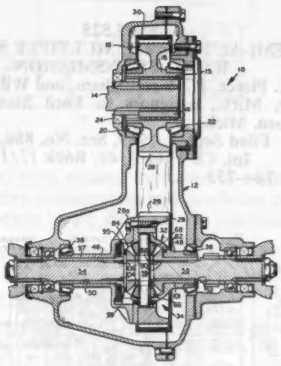
3,605,522
DRIVE UNITS
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Nov. 22, 1968, Ser. No. 778,259
Claims priority, application France, Nov. 22, 1967, 129,258
Int. Cl. F02b *33/00;* **F16h** *37/00*
U.S. Cl. 74—689 **5 Claims**



The present invention relates to drive units and according thereto such a unit comprises a two-stroke engine having a scavenging compressor, a speed regulator and a differential gear. One of the elements of the differential is coupled to a shaft of the compressor, a second of these elements is coupled to the output shaft of the engine and the third one of these elements is fixed to an input shaft of the speed regulator. The speed regulator may take the form of a hydrokinetic torque converter or it may be electrical or mechanical, in which latter case, it can conveniently comprise a pair of variable diameter pulleys interconnected by belt means.

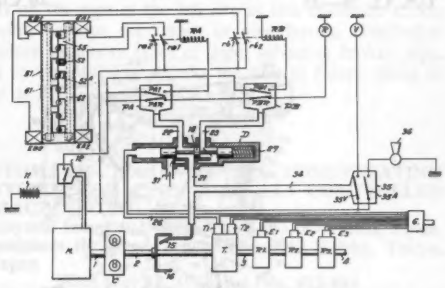
3,605,523
TRANSFER CASE INCLUDING A TORQUE SPLITTING DIFFERENTIAL
Loren J. O'Brien, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Sept. 15, 1969, Ser. No. 857,972
Int. Cl. F16h *1/40*
U.S. Cl. 74—711 **5 Claims**

A chain drive transfer case for a full time four-wheel drive vehicle including an inter-axle differential comprised of a standard differential plus a torque-responsive clutch introduced between coaxial output shafts for driving the front and rear axles of the vehicle. The torque-responsive clutch is designed to divide the engine torque unequally at the output shafts in such proportion that at all times sufficient torque is applied to the rear axle and relatively



lesser torque to the front axle. Cooperating positive and friction clutch means make up the torque responsive clutch which is operative through driving engagement with one of the side gears of the differential to cause the unbalance in the drive system.

3,605,524
GEAR-BOX SYSTEM INCLUDING A TORQUE CONVERTER AND SPEED RESPONSIVE MEANS
Charles J. Debeaud, Bougival, France, assignor to Etablissements Henri J. de Tabet, Nanterre, Hauts-de-Seine, France
Filed Apr. 16, 1969, Ser. No. 816,754
Claims priority, application France, May 14, 1968, 151,686
Int. Cl. F16h *47/00*
U.S. Cl. 74—731 **8 Claims**



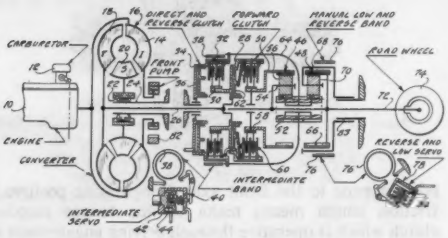
A gear-box system comprising a hydraulic torque converter followed by mechanical stages, which provide different ratios, and equipped with indicating devices responsive to the rotational velocity of the output shaft of the torque converter, one device being maintained in the active position as long as the rotational velocity of the output shaft of the torque converter is lower than a predetermined value at which the slippage of the torque converter is considered excessive and calls for downshifting of the gear-box. A second indicating device is maintained in the active position when the rotational velocity

of the output shaft of the torque converter exceeds a predetermined value which is higher than the aforesaid value and at which it is desirable to change to a higher ratio of the gear-box. The inactive state of each of said two indicating devices is representative of the normal operative state of the system as a whole.

3,605,525
SEMI-AUTOMATIC MULTIPLE SPEED RATIO TRANSMISSION

Stanley L. Pierce, Jr., Birmingham, and William C. Winn, Inkster, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 8, 1969, Ser. No. 856,528
Int. Cl. F16h *3/44*; **B60k** *17/10*
U.S. Cl. 74—753 **3 Claims**

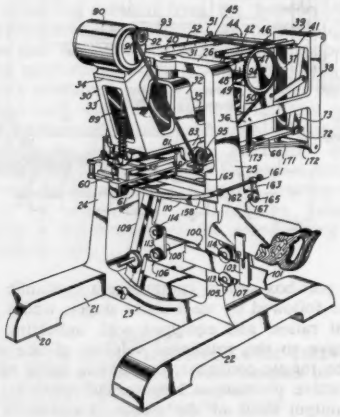


A planetary gear transmission mechanism having a hydrokinetic torque converter, two simple planetary gear units and a semi-automatic ratio control valve system for controlling speed ratio changes in the gear units, said system including simplified shift valve components and timing valve elements for establishing proper shift points as manual transmission ratio selections are made.

3,605,526
SAW SHARPENING MACHINE

Jesse R. Crapo, Rte. 2, Duluth, Ga. 30136

Filed Oct. 7, 1969, Ser. No. 864,466
Int. Cl. B23d *63/08*
U.S. Cl. 76—35 **20 Claims**



This invention relates to an automatic sharpening device for use in sharpening a cutting tool having a series of cutting teeth such as carpenter's hand saws, key hole saws, compass saws and fine tooth circle saws. More particularly, this invention includes a base frame for supporting a cutting tool for lateral indexing movement, including controlled indexing means operative to serially present each tooth of the series of cutting teeth to a sharpening position. Mounted on the base frame is a sharpening means such as a file, detailed in supporting relationship relative to the cutting tool for orbital movement in a plane disposed at an angle with respect to the plane of the cutting tool. The sharpening means includes control means operatively associated therewith for effecting the orbital movement of the sharpening means in such a manner that a sharpening of the cutting tooth is accomplished during one portion of the orbital movement and wherein the sharpening means is separated from the cutting tooth during a second portion of the orbital movement. The sharpening means also includes control means for effecting automatic angular adjustment between the plane of the cutting tool and the plane of motion of the sharpening means for the purpose of adjusting the sharpening means to sharpen angular offset cutting edges. The control means for effecting the automatic angular adjustment is detailed to effect the angular adjustment during the second portion of the orbital movement of the sharpening means.

3,605,527
METHOD FOR MANUFACTURING HIP REAMERS

Charles E. Gambale, East Boston, Mass., assignor to Gambale and Merrill Corporation, Boston, Mass.

Filed June 3, 1969, Ser. No. 830,046
Int. Cl. B21k *21/00*
U.S. Cl. 76—101A **11 Claims**

Methods and apparatus are disclosed for manufacturing reamers for use in hip arthroplasty. A solid-type, center-cutting acetabular reamer is made by: milling a piece of cylindrical stock to a spherical dome; cutting recesses adjacent to the apex of the reamer by moving the dome-shaped blank rectilinearly into a frusto-conical rotary cutter having a flat upper surface which is located in the plane of, but offset from, the centerline of the dome-shaped blank; cutting radial teeth by engaging the blank with a rotary cutter and moving the blank in an arcuate path while in engagement with the rotary cutter; cutting chip-breaker grooves by moving the blank in an arc while in engagement with a rotating saw blade while the blank is tipped upwardly at an angle; and threadedly securing a shaft to a threaded boss provided on the rear side of the blank and welding it thereto with the use of special

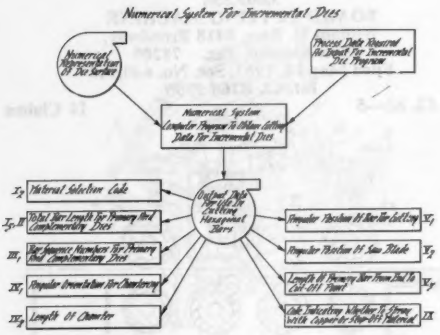
welding rig. Fenestrated head and acetabulum reamers are provided from a dome-shaped spherical blank which is formed by cold-pressing a circular blank by means of a spherical male die member and a spherical female die member. This blank is then squared off and placed in a special collet for rectilinear movement into engagement with frusto-conical cutting means which cuts openings adjacent to the center of the blank. In the case of head reamers, the blank is then provided with internal radial teeth by tipping it upwardly at an angle while it is held in a special collet and moving it rectilinearly into engagement with a frusto-conical rotary cutter. A concentric shaft may then be welded to the outer surface of the blank by the use of a special welding rig. Eccentric handles may also be welded to the peripheral edge of the blank by employing a special welding rig.

3,605,528

INCREMENTAL CONSTRUCTION OF THREE-DIMENSIONAL OBJECTS HAVING PREMACHINED ROD ELEMENTS AND METHOD FOR FORMING THE SAME

Foster E. Whitacre, Farmington, Archie A. Pearson, Dearborn, Harold N. Bogart, Farmington, and Norman W. Hopwood, Jr., Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 2, 1968, Ser. No. 749,685
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 **12 Claims**


Numerical System For Incremental Dies
Numerical Representation Of Die Surfaces
Process Data Required For Input For Incremental Die Program
Numerical System Computer Program To Obtain Cutting Data For Incremental Dies
Material Selection Code
Total Bar Length For Primary And Complementary Dies
The Smallest Number For Primary And Complementary Dies
Angular Orientation For Chamfering
Length Of Diameter
Optimal Data For Use In Cutting Hexagonal Bars
Angular Position Of Bar For Cutting
Angular Position Of Saw Blade
Length Of Primary Bar From Tail To Cut-Off Point
Code Indicating Whether Or Spray With Copper Is Required For Material

A three-dimensional article and a method of manufacturing it, said article comprising individual increments in the form of rods that are premachined or preformed and assembled in registry, said rods being precut to discrete lengths, one end of each rod forming an increment of a precalibrated surface contour, each incremental surface being located in an optimum plane tangent to the precalibrated surface, the rod lengths and the cutting angles for the individual rods being determined by numerical control techniques.

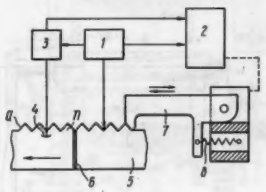
3,605,529

METHOD OF STOPPING MACHINE FOR SHARPENING AND SETTING SAW TEETH

Vladimir Viktorovich Idel, Gorkovskoi oblast., ulitsa Graftio 15, kv. 6, Zavolzhie, U.S.S.R.

Filed Feb. 11, 1970, Ser. No. 10,393
Claims priority, application U.S.S.R., Feb. 19, 1969, 1,304,933
Int. Cl. B23d *63/00*
U.S. Cl. 76—112 **1 Claim**

A method of stopping the machine adapted for grinding and setting saw teeth, according to which an electrical-insulation coating is provided on the saw band, and the saw band is electrically connected between the power supply source of the machine drive and this drive, said electrical connection being effected by means of a slidable contact which, when encountering said insulation coating, interrupts the power supply circuit of the machine drive.

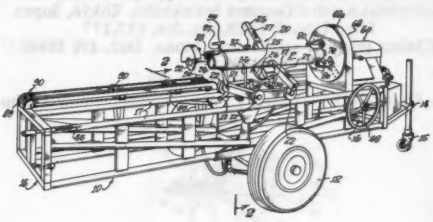


3,605,530

MOBILE FIELD LATHE

John T. Doty, 2238 E. 21st St., Long Beach, Calif.

Filed Nov. 29, 1968, Ser. No. 779,786
Int. Cl. B23b *5/16*
U.S. Cl. 82—4C **13 Claims**



A mobile field lathe operated by compressed air has been designed particularly for cutting and machining operations on asbestos cement pipe. It has been found advantageous to cut pipe to length and to machine the ends on the pipe at the job site as this operation makes possible various economies in pipe layout, elimination of more expensive types of pipe, salvaging broken pipe, and so on. Mobility permits the unit to follow along as pipe is laid.

3,605,531

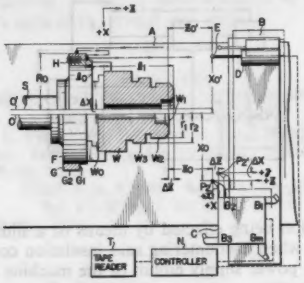
AUTOMATIC TOOL POSITION COMPENSATING SYSTEM FOR A NUMERICALLY CONTROLLED MACHINE TOOL

Tadayoshi Izumi and Hideo Hirokawa, Kawasaki, Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1969, Ser. No. 823,893
Claims priority, application Japan, Aug. 29, 1968, 43/61,447, 43/61,448
Int. Cl. B23b *3/28*
U.S. Cl. 82—14D **3 Claims**

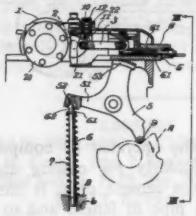
In a numerically controlled machine tool having a tool support slide, a multiple tool turret, a controller and a measuring element, a ring gauge is mounted on the main spindle of said machine tool coaxially thereto so that the deviations of said main spindle in X and Z directions may be accurately measured and compensated for. To do this, the measuring element utilizes the outer peripheral surface and the inwardly facing end surface of said ring gauge as the reference or standard positions in X and Z directions, respectively. The deviations are compensated

in the succeeding cutting process for shifting the tools respectively, each in accordance with the error detected, by parallel shifting of the co-ordinate axis of the tools.



Alternately, the axes may be shifted angularly, or the parallel shift may be combined with the angular shift of the co-ordinate axes.

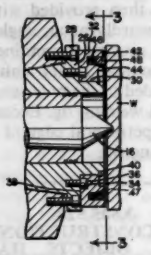
3,605,532
TURRET-SLIDE FEED MECHANISM FOR TURRET TYPE SINGLE-SPINDLE AUTOMATIC MACHINES
Kyushichiro Tanaka, Nagaoka-shi, Japan, assignor to Kabushiki Kaisha Tsugami Seisakusho, Tokyo, Japan
Filed Dec. 8, 1969, Ser. No. 883,177
Claims priority, application Japan, Dec. 19, 1968, 43/92,653
Int. Cl. B23b *21/00*
U.S. Cl. 82—21 **7 Claims**



The positioning accuracy of the turret slide is much improved by use of a relatively strong slide-restoring spring acting directly upon the turret-actuating cam-follower lever and a relatively weak spring effective to eliminate backlash at connections between the cam follower lever and the turret index shaft. Such improvement is further ensured by a third spring enabling the index shaft to have a definite stop position.

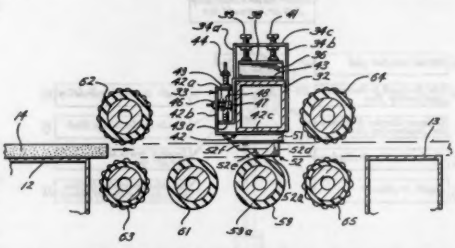
3,605,533
WORKPIECE DRIVE MEANS FOR TURNING LATHES
Thomas E. Dugle, Cincinnati, Ohio, assignor to Planet Products Corporation, Cincinnati, Ohio
Filed Mar. 4, 1968, Ser. No. 710,187
Int. Cl. B23b *33/00*
U.S. Cl. 82—40 **15 Claims**

The lathe includes opposed bodily shiftable headstocks each having a rotational spindle for engaging opposite ends of a workpiece as the headstocks are shifted toward one another. The spindles are rotated by means of two identical hydraulic pump-motors connected in a pressurized fluid piping system wherein fluid is kept in circulation by a third identical hydraulic pump-motor driven by a constant speed electric motor. By including the spindle-driving pump-motors in a common fluid system, said pump-motors are obliged to share equally the work of driving opposite ends of an elongate workpiece supported between centers on the spindles. The drive means between each spindle and one end face of the workpiece, is a purely frictional drive means the effectiveness of which is aided by a high-pressure auxiliary means to elevate and maintain the force of frictional contact between the work-



piece end and a unique friction-ring assembly on the spindle involving hard and soft polyurethane transmission members. The pump-motors, two of which operate as spindle drivers, while one operates as a pump delivering operating fluid to the others, are all identical and interchangeable with one another in the interests of economical maintenance and speedy replacements.

3,605,534
BOARD CUTTING MACHINE
William H. Barr, 8418 Broadway, San Antonio, Tex. 78209
Filed May 24, 1967, Ser. No. 640,948
Int. Cl. B26d *3/06*
U.S. Cl. 83—5 **16 Claims**

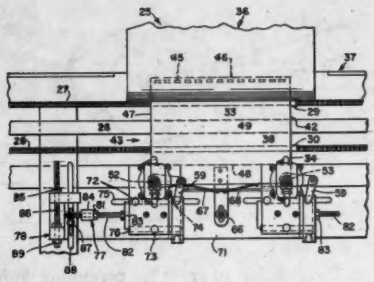


This invention relates to board cutting machines, and more particularly to machines for forming structures from fibrous board having an impermeable facing on one or both sides. The machine cuts grooves in a board of material which permits the board to be folded into a rectangular form to provide a duct. The board may also be wrapped around any structure for insulation, such as pipe or structural members.

3,605,535
COMBINED PUNCHING AND CORNERING APPARATUS AND METHOD
George D. Love, Saco, and Edson H. Stacy, East Baldwin, Maine, assignors to Southworth Machine Company, Portland, Maine
Filed Dec. 18, 1969, Ser. No. 886,124
Int. Cl. B26f *1/06*
U.S. Cl. 83—40 **8 Claims**

An automatic punching machine having a set of punches along one side of a punching station, includes a pair of independently operable die cutting heads detachably fixed on the other side of the punching station. Each individual and successive lift, or stack, of limp

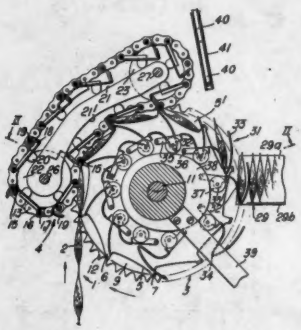
sheets advances along a path and halts at the punching station while the binding apertures are punched and the outer corners rounded, straight cut, notched, etc., substantially simultaneously, and while the sheets of the lift are clamped onto the table and in registration with the back gauge.



3,605,536
ARTICLE HANDLING APPARATUS

Jacob Salomon, 10 Weizman Square, Holon, Israel

Filed Sept. 20, 1968, Ser. No. 761,112
Int. Cl. B26d *1/56, 7/06*
U.S. Cl. 83—96 8 Claims



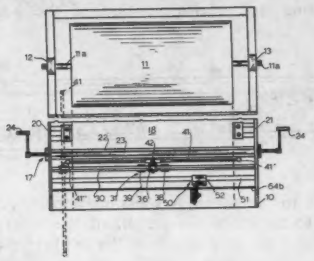
The specification discloses a star wheel apparatus used in the preparation of tea bags wherein a continuous web of bags may be fed to the star wheel for severance in the form of discrete bags in individual pockets of the wheel, the severing operation being performed by fixed knives on the star wheel co-operating with other relatively movable knife blades. Advantageously the severed tea bags may be displaced radially outwardly and angularly rearwardly as the rotation of the star wheel carries them round towards a delivery station so that they are deposited with reduced linear velocity on an extractor tooth of a delivery chute. Desirably the relatively movable co-operating knife blades may be mounted on a continuous chain element which has a run substantially coincident with part of the periphery of the star wheel.

3,605,537
INSULATION CUTTER

Lloyd P. Pickler, 634 McKee St., Albemarle, N.C. 28001

Filed Aug. 13, 1969, Ser. No. 849,687
Int. Cl. B26d *1/20, 19/00*
U.S. Cl. 83—121 1 Claim

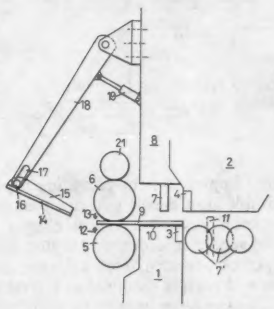
An insulation cutter receives a supply roll of insulation material, unrolls and cuts the material to a preset width and length. Special handle arrangements allow the operator to perform the unrolling of the material and the cutting from either side of the machine and with minimum work aisle obstruction during periods of inactivity.



3,605,538
DEVICE FOR POSITIONING PLATE FOR CUTTING BY A CROSSCUT SHEAR

Bruno Bohmer, Dusseldorf, Josef Schiffers, Monchen Gladbach-Rheindahlen, and Rainer Kuhnpast, Dusseldorf, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed May 21, 1969, Ser. No. 826,483
Claims priority, application Germany, May 30, 1968, P 17 52 465.1; Oct. 8, 1968, P 18 01 689.2
Int. Cl. B26d *5/40*
U.S. Cl. 83—206 19 Claims



The invention relates to a device for advancing the end portion of a length of plate which is to be cut by a crosscut shear, the device comprising a primary conveying means for normally moving the plate, and a pushing means which moves from outside the path of movement of the plate to engage the end portion of the plate while the end portion is still entrained by the primary conveying means, and then to advance the plate.

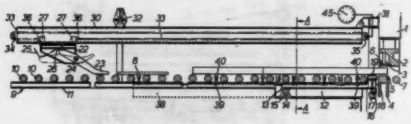
3,605,539
APPARATUS FOR USE WITH CUTTING DEVICES FOR ELONGATE WORKPIECES

Ewan Christian Hewitt and William James Richmond, Sheffield, England, assignors to Davey and United Engineering Company Limited, Sheffield, England

Filed May 19, 1969, Ser. No. 825,509
Claims priority, application Great Britain, May 21, 1968, 24,106/68
Int. Cl. B26d *5/20*
U.S. Cl. 83—278 12 Claims

Apparatus for measuring off lengths of metal to be cut from a metal slab or bloom by a shear. The apparatus which is arranged wholly on the entry side of the shear includes a roller table for supporting a workpiece to be sheared, a pusher member engageable with the tail end

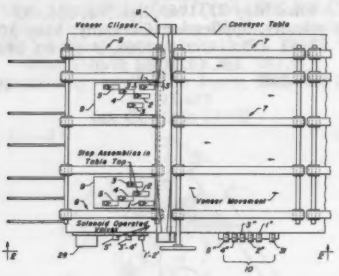
of the workpiece and which is capable of displacing the workpiece under control towards the shear and an indicator means operatively coupled to the pusher member for indicating the precise position of the pusher member relative to the shear. A weighing apparatus may be provided to ascertain the weight of the workpiece so that the weight per unit length of the workpiece can be calculated.



3,605,540
APPARATUS FOR DIMENSION CLIPPING OF VENEER

Allan E. Williams, Mellen, and Royal C. Cady, Highbridge, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 24, 1969, Ser. No. 844,409
Int. Cl. A26d *7/16*
U.S. Cl. 83—241 **3 Claims**



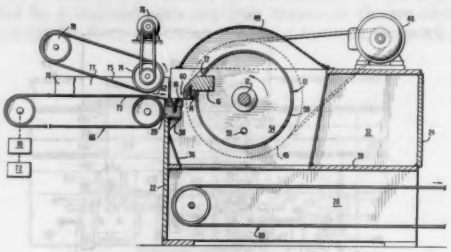
A veneer clipping system providing a plurality of vertically movable stop means that are positioned at varying spaced distances beyond a veneer clipper so as to effect a cutting of veneer into desired lengths. Each of the stop means is power operated from an operator's switch control station and each is mounted at a level just below that of the veneer conveyor means to thus be movable from just below the level of the latter to above the conveyor means to thereby provide for stopping the travel of the veneer at a selected distance beyond the clipper blade.

3,605,541
ROTARY SHEAR AND SCRAP PREPARATION METHOD

Melvin B. Ruben, Skokie, and Billy J. Weston, Chicago, Ill., assignors to Electronic Memories & Magnetics Corporation, Hawthorne, Calif.

Filed Apr. 11, 1969, Ser. No. 815,354
Int. Cl. B23d *17/04*
U.S. Cl. 83—355 **24 Claims**

High capacity shearing to prescribed lengths of various materials from rigid rods to pliable wire is provided by a rotary drum shear, eccentrically weighted, with a cutting blade peripherally mounted so as to utilize the eccentric weighting to increase the force available for heavy-duty scrap cutting usage. Elongated scrap material to be cut to length is fed radially inwardly toward the axis of rotation of the drum between a fixed blade and the drum mounted blade. With this system cutting force is uniform across the full length of the cutting blades. Material feed is controlled both as to speed and presentation. Feed rate, coordinated with r.p.m. of the shear drum, controls length of cut. Conveying and hold down structures control presentation of material and hold material during cutting. The rotary drum sweeps cut material toward discharge

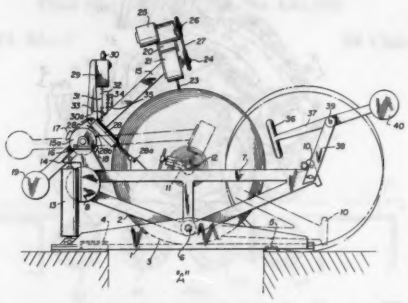


means. The principle of operation permitting positive control of feeding, shearing, and discharging minimizes safety hazards to personnel.

3,605,542
PAPER ROLL STRIPPER

William George Spear Smith, P.O. Box 10, Topsail C.B., Newfoundland, Canada, and William G. S. Smith, 333 Hamilton Ave., St. John's, Newfoundland, Canada

Filed Mar. 14, 1969, Ser. No. 842,413
(Filed under Rule 47(a) and 35 U.S.C. 116)
Claims priority, application Great Britain, Mar. 14, 1968, 12,502/68
Int. Cl. B26d *1/46*
U.S. Cl. 83—564 **7 Claims**



The paper roll stripper is contemplated which includes means for lifting and locating a paper roll, and plough means mounted on a belt which means are drawn along the roll of paper gradually removing the paper from the roll.

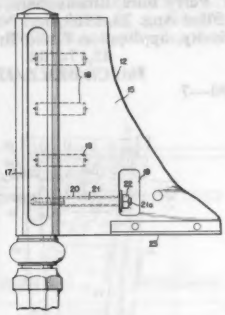
3,605,543
STRUCTURE FOR FIXING PIANO LEGS

Masaharu Ohara, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed July 16, 1970, Ser. No. 55,492
Claims priority, application Japan, July 21, 1969, 44/68,781, 44/68,782, 44/68,783
Int. Cl. G10c *3/02*
U.S. Cl. 84—177 **6 Claims**

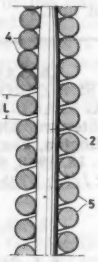
A structure for fixing piano legs comprising a pair of wooden side brackets supporting a keyboard, each bracket having grains running substantially in a horizontal direction and having a butt end, wooden end boards each bonded to said butt end and having grains running perpendicularly to the grain direction of said bracket, said bracket and said end board being covered and connected together by a decorative panel, and leg members fixed to

said end boards by means of dowels and having grains directed substantially in the same direction as that of the grains of said end boards. The leg members may be fixed



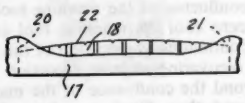
to the brackets by means of bolt and nut members or keyboard-mounting metal plate members, in which cases the end boards may be omitted.

3,605,544
STRING FOR MUSICAL INSTRUMENTS
Masaru Kondo, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed June 25, 1969, Ser. No. 836,451
Claims priority, application Japan, June 27, 1968, 43/54,950
Int. Cl. G10c *3/06*
U.S. Cl. 84—199 **5 Claims**



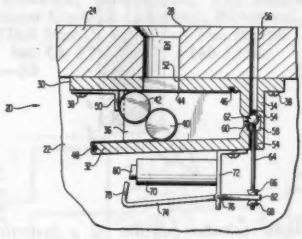
A string for musical instruments comprising a core wire and a covering wire in which the pitch of winding said covering wire is larger than the diameter of said covering wire, and being characterized in that each turn of said covering wire does not make contact with each adjacent turn of said covering wire, and thus a sound with good tone quality and lasting vibration can be produced.

3,605,545
ADJUSTABLE BRIDGE FOR STRINGED MUSICAL INSTRUMENT
Stanley E. Rendell, Kalamazoo, Mich., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.
Filed May 18, 1970, Ser. No. 38,315
Int. Cl. G10d *3/04*
U.S. Cl. 84—307 **10 Claims**



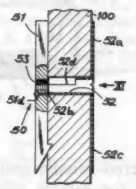
A bridge, such as for a guitar, includes a rigid base that has an elongated recess in which there is slidably supported a saddle which supports the guitar strings. As the saddle is adjusted vertically, it is guided by a guide surface within the recess to preclude any rocking or cocking.

3,605,546
ROLLER VALVE DEVICE
Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980
Filed May 15, 1970, Ser. No. 37,619
Int. Cl. G10b *3/06*
U.S. Cl. 84—336 **10 Claims**



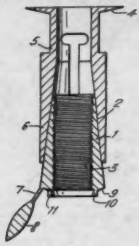
The roller valve device minimizes the sliding friction in the operation of the valve by locating two rollers between a pair of guide surfaces which are spaced apart a difference less than the sum of the diameters of said rollers and wrapping a flexible resilient band under tension about said rollers in an S-shaped configuration to define a freely rotatable cluster. One side of the cluster is exposed to air under pressure and the valve passage is located in one of the guide surfaces. Upon controlled movement of the cluster between the guide surfaces, the band may be selectively displaced between a non-sealing position with respect to the valve passage to control the flow of air pressure through said valve passage.

3,605,547
SELF-ALIGNING SCREW ANCHOR
David I. Millet, 155 E. 4th St., New York, N.Y. 10009
Filed Apr. 10, 1969, Ser. No. 815,114
Int. Cl. F16b *37/04*
U.S. Cl. 85—3S **2 Claims**



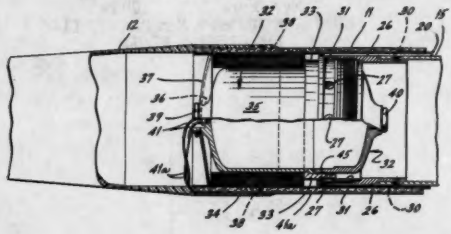
A screw anchor, to be engaged by a bolt traversing a wall, comprises a rigid bar alongside which a lanyard is entrained through a hole preformed in the wall or pierced in it by an enlarged, pointed head of the bar; the lanyard is attached to the bar in the vicinity of a threaded transverse bore thereof which aligns itself with the pierced hole when the bar is pulled flat against the remote wall surface after its trailing end or foot has cleared the hole, means being provided for swinging the bar out of alignment with the lanyard in order to prevent its foot from blocking the pullback.

3,605,548
FASTENING DEVICE
Louis Aackersberg Mortensen, Kongevejen 35, Birkerod, Denmark
Continuation of application Ser. No. 718,950, Apr. 4, 1968. This application Aug. 4, 1969, Ser. No. 849,266
Claims priority, application Denmark, Apr. 5, 1967, 1,943/67
Int. Cl. F16b *13/06*
U.S. Cl. 85—73 1 Claim



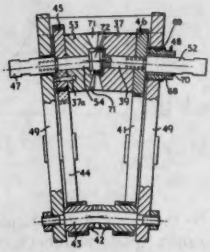
The plastic tubular portion of a fastening device is provided at one end with a closure disc which is swingably attached thereto, and which is held in a closing position by locking means interacting between adjacent surfaces of the disc and of the tubular portion. Displaced from its closing position by the forward motion of a screw, bolt or the like advanced through the tubular portion, the disc is swung out of the way into an open position and may be subsequently reset into the closing position.

3,605,549
MISSILE LAUNCHING APPARATUS
Arthur Moskowitz, Santa Ana, William F. MacInnes, Newport Beach, and Calhoun W. Sumrall, Costa Mesa, Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.
Filed Nov. 20, 1968, Ser. No. 777,250
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.806 3 Claims



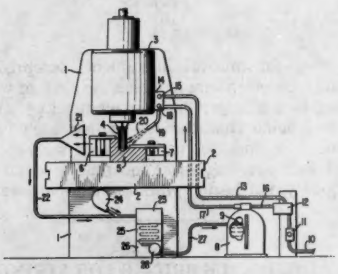
A rocket powered missile and cooperating launching tube from which the missile can be catapulted at high initial velocity. The missile includes a hollow fuselage section which is telescopingly fitted over a launching tube open at its forward end and closed at its rearward end. Stabilizing fins and rocket motors are provided on the fuselage section, and a gas generator is provided toward the forward end of the section to supply sufficient gas pressure within the launching tube to launch the missile. Prior to launching, the missile is held on the launching tube by shear pins. Ignition of the gas generator pressurizes the launching tube so that the resultant force on the shear pins exceeds their shear strength, whereupon the missile is launched, and the rocket motors are ignited to propel the missile in its flight.

3,605,550
METHOD AND APPARATUS FOR CUTTING GEARS USING A GEAR SHAPED CUTTER
William Charles Blything, 37 Pendragon Road, Perry Barr, Birmingham, England
Filed Aug. 28, 1969, Ser. No. 853,857
Claims priority, application Great Britain, Sept. 5, 1968, 42,174/68
Int. Cl. B23f *5/12*
U.S. Cl. 90—7 8 Claims



Method and apparatus for forming the teeth of a rotary positive displacement unit which enables production on a substantial scale. The unit comprises two members, each provided with teeth, one more tooth being provided on one member than on the other member. The method and apparatus involve employing a cutting tool cut to the same form as that of the first member and running the cutting tool in contact with a blank to form the second member such that the cutting tool and blank rotate relatively to each other while tilted relatively to each other with a swash plate motion corresponding exactly with the relative motion between the two members of the rotary positive displacement unit.

3,605,551
METHOD OF SUB-ZERO COOLING WHILE MACHINING SPACE-AGE MATERIALS
Richard B. Steward, 838 W. Mitchell St., Arlington, Tex. 76010
Filed Nov. 18, 1968, Ser. No. 776,700
Int. Cl. B23c *1/00*; B23b *3/00*; F01m *1/00*
U.S. Cl. 90—11 3 Claims



Sub-zero cooling while machine tooling work pieces formed of space-age metals and materials, including the steps of vaporizing by air pressure a mixture of a super evaporative coolant and cutting solution in a storage tank; conveying said vaporized mixture by air pressure and discharge same as a mist through a nozzle disposed adjacent the confluence of the machine tool and the work piece to sub-zero cool the machine tool and work piece by the rapid continuous evaporation of the super evaporative coolant; recovering at least a portion of the coolant for reuse beyond the confluence of the machine tool and work piece, and then filtering and condensing the recovered coolant and redirecting the condensed coolant back into the storage tank for reuse.

3,605,552

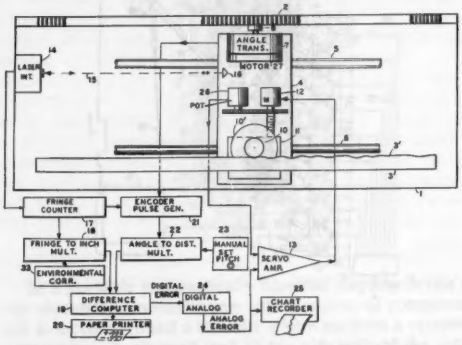
MEANS FOR GENERATING COMPENSATING MEANS

Anwar K. Chitayat, Plainview, N.Y., assignor to OPTOmechanisms, Inc., Plainview, N.Y.

Continuation-in-part of abandoned application Ser. No. 652,516, July 11, 1967. This application June 2, 1969, Ser. No. 835,873

Int. Cl. B23c *1/16*

U.S. Cl. 90—13C 18 Claims



Automatic means for cutting compensating cams for long lead screw and racks such as those used in precision machine tools. The workpiece lead screw or rack is mounted parallel to the cam to be cut. A movable platform mounts a milling cutter. The platform is also connected to the lead screw by a nut or to the rack by a pinion. Angular motion of the lead screw or pinion is measured and transmitted to a computer. The linear motion of the platform is measured with an interferometer. The two measurements are compared in the computer and the output is fed to a servo mechanism which controls the milling cutter. Therefore, as the platform moves down along the workpiece, the cam is automatically cut. A chart or digital printed tape output may also be provided.

3,605,553

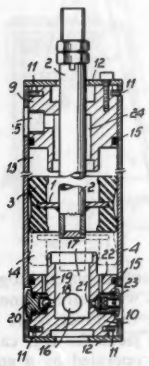
PRESSURE FLUID OPERATED CYLINDER

Pier Luigi Panigati, Via Cesare Battisti, 20042 Albiate Brianza, Milan, Italy

Filed May 5, 1969, Ser. No. 822,864

Int. Cl. F15b *15/22*

U.S. Cl. 91—26 1 Claim



This disclosure relates to a piston for fluid dynamic cylinders which comprises a piston rod, a disc mounted on the piston rod and having a diameter less than the internal diameter of the cylinder in which said piston is arranged to slide, and a resilient sleeve mounted on said disc, the central portion of said resilient sleeve having a smaller diameter than the end portions thereof which engage the inner surface of said cylinder, said end portions of the resilient sleeve being arranged to enter annular seats provided in the ends of said cylinder in the stroke end positions of said piston.

3,605,554

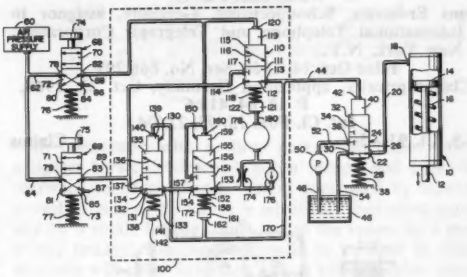
FLUID CONTROL SAFETY SYSTEM

Daniel Philbrick, Phoenixville, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 5, 1970, Ser. No. 16,908

Int. Cl. F16p *3/22*; F16b *13/01*

U.S. Cl. 91—38 10 Claims



A fluid control system utilized in conjunction with a pair of manually operated fluid valves so spaced as to necessitate the use of both hands by an operator for causing actuation of a fluid motor, such as a hydraulic press. The two manually operated valves selectively apply pressurized fluid to a pair of fluid lines which are connected to a main flow valve and a pair of control valves. The control valves are connected through a pressure storage network to the main flow valve for preventing actuation of the main flow valve in the event that both of the manually operable valves are not actuated within a preset time interval.

3,605,555

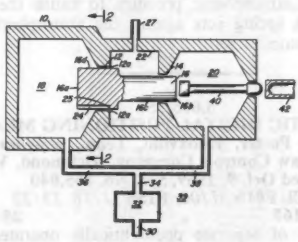
PNEUMATIC VIBRATION GENERATOR

Boyd A. Wise, Rochester, N.Y., assignor to General Dynamics Corporation

Filed Jan. 5, 1970, Ser. No. 668

Int. Cl. F01l *15/02, 21/02*; F01b *7/18*

U.S. Cl. 91—50 10 Claims



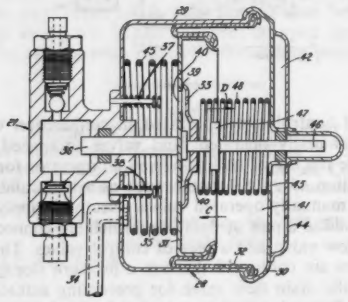
A self-excited pneumatic oscillator is described which includes a reciprocating valve member that is capable of high frequency operation. The valve member is disposed

in a housing having a first active spring chamber, and a second spring chamber spaced therefrom. Both spring chambers are charged by a source of pressurized air and act upon opposite ends of the valve member. A discharge chamber is disposed so that it is brought periodically in communication with the first chamber as the valve reciprocates, whereby the oscillator converts the energy of the pressurized fluid flowing from the active chamber to the discharge chamber into self-sustained reciprocating motion of the valve. The oscillator includes a filter between the source of pressurized air and the spring chambers to minimize alternating pressure fluctuations in the air supply line, thereby enhancing efficiency. The filter and valving provide for automatic self-starting followed by a shift to a predetermined valve position for efficient operation at maximum load.

3,605,556
BOOSTER PUMP

Hans Erdmann, Schonbornring, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 14, 1969, Ser. No. 866,297
Claims priority, application Germany, Oct. 22, 1968, P 18 04 411.6
Int. Cl. F01l *15/02, 21/04*
U.S. Cl. 91—50 **3 Claims**



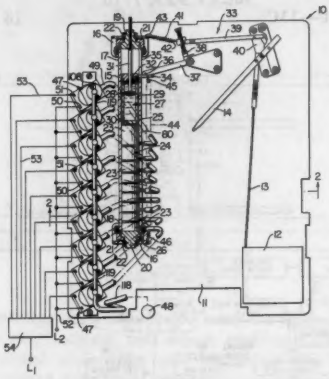
A reciprocating plunger pump for use as a booster in power assisted brakes in which a pump actuator directly coupled to the pump is driven by the difference between atmospheric pressure and engine vacuum acting across a piston which is sealed by a rolling membrane. The actuator may have a reversing valve in the piston which automatically switches the pressure on one side of the piston between the atmospheric and engine vacuum pressure at the end of each stroke while maintaining the other side at atmospheric pressure to cause the piston to oscillate. A spring acts against the atmospheric pressure on the piston.

3,605,557
PNEUMATIC DIGITAL POSITIONING MEANS

Louis M. Puster, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 9, 1969, Ser. No. 865,040
Int. Cl. F01b *31/00;* **F15b** *11/18, 15/22*
U.S. Cl. 91—167 **25 Claims**

A plurality of separate pneumatically operated actuators disposed in aligned and abutting relation to provide a linear positioning unit having opposed ends with each actuator being individually operable to linearly extend itself when actuated and thereafter to linearly collapse itself when deactuated whereby one end of the unit will be correspondingly linearly extended relative to the other end thereof and thereafter be linearly collapsed relative to the other end thereof. A control device being operatively interconnected to the one end of the positioning unit to be controlled in relation to the position of the one end relative to the other end thereof and control

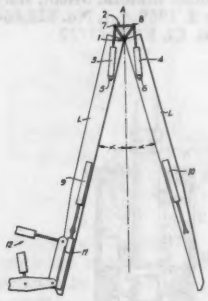


means for directing a source of pneumatic fluid to at least one of the actuators to extend the one end of the unit by the degree of actuation of the one actuator and for thereafter disconnecting the source from that one actuator to collapse the one end of the unit by the degree of deactuation of the one actuator.

3,605,558
SCISSORS WITH A HYDRAULIC GOVERNOR FEED MEANS FOR OPENING AND CLOSING THE SAME SYMMETRICALLY

Claude Leclercq, Tarbes, France, assignor to French State, % Ministere d'Etat Charge de la Defense Nationale, Paris, France

Filed Oct. 6, 1969, Ser. No. 863,838
Claims priority, application France, Oct. 4, 1968, 168,705
Int. Cl. F01b *25/04;* **F15b** *11/22*
U.S. Cl. 91—171 **9 Claims**

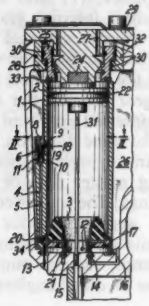


A pair of legs pivotably connected together as a scissors carry respective jacks which are connected to a linkage in turn connected to the pivot shaft of the legs such that by operating the jacks the legs can be opened and closed. The jacks are operated by a governor which includes a follower which responds to any unsymmetrical tilting of the linkage to regulate the flow to the jacks until the linkage and legs are symmetrical.

3,605,559
PNEUMATICALLY ACTUATED STAPLING DEVICE

Jurgen Korth, 7 Birkenweg, 3001 Berenbostel, Germany

Filed Aug. 18, 1969, Ser. No. 851,000
Int. Cl. F15b *13/042*; F01b *11/02*
U.S. Cl. 91—398 8 Claims

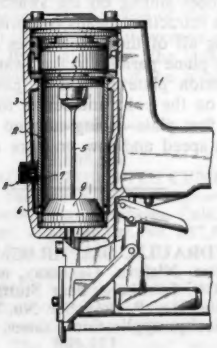


In a portable pnuematically actuated stapling device an air chamber communicating with a source of compressed air is located around a cylinder which encloses a reciprocable piston. In an axial web of the side wall of the cylinder an air passage is provided the upper end of which has a connection with the air chamber of the device and is provided with control means which is alternatively responsive to air pressure in the air chamber and in the interior of the cylinder. The lower end of the air passage adjacent the cylinder bottom is controlled by an axially movable bumper which is provided with vent ports and kept under the pressure of the air chamber. During the piston working stroke the bumper closes the lower end of the air passage and opens the vent ports. At the end of its working stroke the piston abuts the bumper which is pressed downward and opens the air passage, whereby compressed air is admitted to the lower face of the piston, which returns it to its initial upper position.

3,605,560
PNEUMATICALLY ACTUATED STAPLING OR DRIVING TOOL FOR FASTENING MEANS

Adolf Bolte, 34 Boehmerstrasse, Hannover, Germany

Filed Sept. 30, 1969, Ser. No. 862,356
Claims priority, application Germany, Oct. 4, 1968, P 18 01 163.7
Int. Cl. F15b *15/22, 11/15, 13/042*
U.S. Cl. 91—399 6 Claims

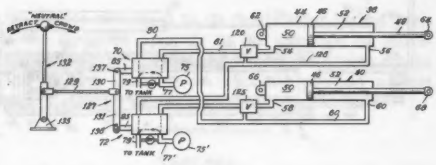


In a pneumatically actuated stapling device in which the air displaced by the piston during its driving stroke is stored in an adjoining chamber of the working cylinder, the air pressure in said chamber is increased by additional compressed air from the interior of the cylinder, which air is admitted to the chamber at the end of said driving stroke. The air pressure in the adjoining chamber is limited by an adjustable pressure responsive valve, which controls the admission of additional compressed air to said chamber at the end of the driving stroke.

3,605,561
ONE HANDLE SEQUENCE SELECTING VALVING FOR CROWD CYLINDERS

William J. Lado, Rome, N.Y., assignor to Pettibone Corporation, Chicago, Ill.

Filed Dec. 22, 1969, Ser. No. 887,465
Int. Cl. F15b *15/16*
U.S. Cl. 91—413 6 Claims

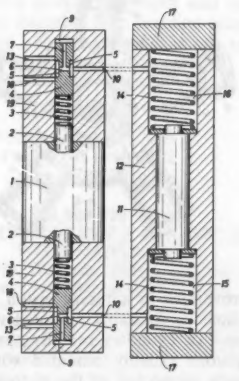


In connection with a three part crane boom having a lighter forward telescopic boom section and a heavier rearward telescopic boom section controlled by separate crowd cylinders, the action is selectively controlled manually by a single handle connected to the valves by a preference linkage. Moving the handle to its limit in either direction will either extend or retract both cylinders simultaneously. Moving the handle half-way in the crowd direction will extend only the cylinder for the larger intermediate section. Moving the handle halfway in the retracting direction will retract only the smaller forward section. The preference linkage prevents the wrong sequencing, i.e., having the lighter forward boom section extended out from the heavier section first, or more than the heavier section is extended out from the still heavier base section.

3,605,562
HYDRAULIC RELAY

Kai Ludvig Larsen, Hvidovre, Denmark
(Valbygardsvej 70, Copenhagen, Denmark)

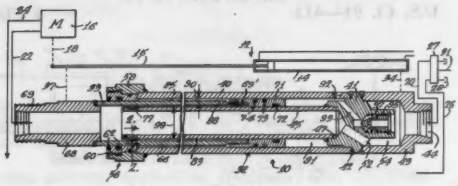
Filed Nov. 20, 1968, Ser. No. 777,225
Claims priority, application Denmark, Nov. 20, 1967, 5,777/67
Int. Cl. F15b *11/10, 13/044*
U.S. Cl. 91—433 3 Claims



The hydraulic relay has a hydraulic control device operable by variable means and which device is constantly

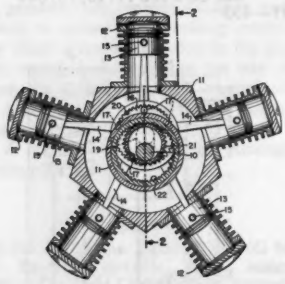
under the influence of the hydrostatic pressure of an operating cylinder connected thereto, in a direction opposite to the control force acting to open the pressure medium supplied to the operating cylinder.

3,605,563
TELESCOPIC FLUID FEED LINES
John T. Parrett, Benton Harbor, Mich., assignor to Koehring Company, Incorporated
Filed Apr. 25, 1969, Ser. No. 819,402
Int. Cl. F16l *27/12*
U.S. Cl. 91—462 **6 Claims**



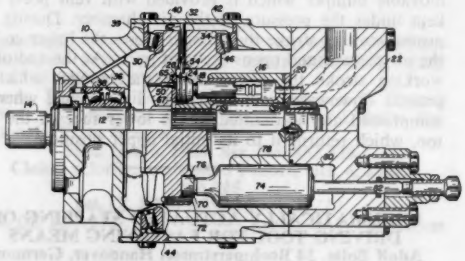
Telescopic fluid feed lines for conveying hydraulic fluid to and from a remote load consisting of an outer tube telescopically receiving an inner tube with an annular piston on the end thereof slidable on a rod sleeve fixed with respect to the outer tube, there being provided an area on the piston which is subjected to fluid under pressure for the purpose of minimizing the compressive forces on the inner tube with this area being equal to the area of the stationary sleeve for the purpose of balancing the hydraulic forces acting on the inner tube.

3,605,564
ROTARY PISTON DEVICE
Roger C. Shoemaker, 29 Boulevard Road, Cedar Knolls, N.J. 07927
Filed Dec. 22, 1969, Ser. No. 887,183
Int. Cl. F01b *13/04;* **F02b** *57/00*
U.S. Cl. 91—495 **4 Claims**



An improvement in a rotary piston device comprising a shaft, a housing rotatably mounted with respect to the shaft, a bank of cylinders radially arranged around the housing, pistons slidably mounted within the cylinders and link rods connected to the pistons, which improvement consists of (a) an internal throw portion of the shaft having an axis displaced from the axis of the end throw portions of the shaft; (b) the axis of the housing coinciding with the axis of the end throw portions of the shaft; (c) a center wheel rotatably mounted around the internal throw portion of the shaft, to which the link rods are attached; (d) a center wheel internal gear affixed to the center wheel, through which the shaft passes; (e) a housing internal gear affixed to the housing, through which the shaft passes; (f) said housing internal gear and said center wheel internal gear having a 1:1 gear ratio; and (g) a transfer external gear through which the shaft passes, the gear teeth of which mesh with the gear teeth of both the center wheel internal gear and the housing internal gear so that the center wheel internal gear, the housing internal gear and the transfer external gear all rotate in the same direction. The improved design avoids counterbalancing problems such as are encountered in designs utilizing master rods or segmentation of the crank throw bearings. The improved rotary piston device may be used in applications for which conventional piston-cylinder units or diaphragms are employed, such as air pressure pumps, vacuum pumps, hydraulic pumps, and steam, gasoline or diesel engines of two or four cycle design.

3,695,565
POWER TRANSMISSION
John G. Berezinski, Livonia, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed Mar. 13, 1970, Ser. No. 19,191
Int. Cl. F04b *1/02*
U.S. Cl. 91—504 **7 Claims**

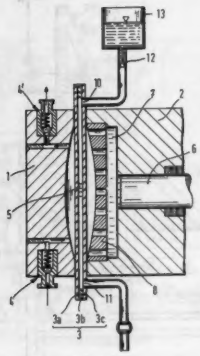


A hydraulic pump or motor unit of the axial piston type in which a swash plate yoke is carried on transverse bearings in a cup-shaped housing and the pistons have ball-jointed shoes sliding on the swash plate has an improved piston retraction means comprising a flat notched plate engaging all of the piston shoes and holding them in a common plane parallel to the swash plate. A second annular retention plate is held in position by a series of shoulders on the yoke and serves to prevent displacement of the first plate during start-up and under conditions of high speed and low pressure operation.

3,605,566
HYDRAULIC DIAPHRAGM PUMP
Gerhard Vetter, Niefern, Germany, assignor to LEWA Herbert Ott, Leonberg, near Stuttgart, Germany
Filed Dec. 9, 1968, Ser. No. 782,172
Claims priority, application France, Dec. 15, 1967, 132,488
Int. Cl. F16j *3/00*
U.S. Cl. 92—5 **4 Claims**

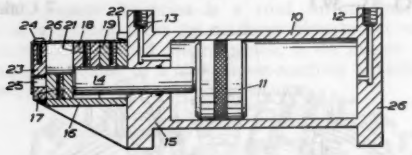
The invention relates to a diaphragm pump, in which the diaphragm consists of at least two individual dia-

phragms. A space between the two individual diaphragms is completely filled with a hydraulic medium. The space



communicates with a hydraulic tank via a conduit containing a non-return valve opening towards the hydraulic tank.

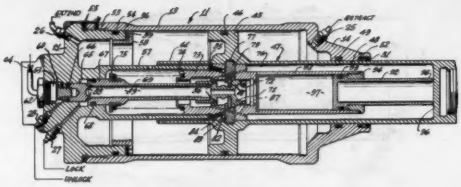
3,605,567
PISTON AND CYLINDER DEVICES
Kenneth Cooper, Orrell, near Wigan, England, assignor to Gullick Limited, Wigan, England
Filed Aug. 12, 1969, Ser. No. 849,309
Claims priority, application Great Britain, Sept. 10, 1968, 42,900/68
Int. Cl. F01b *31/14*
U.S. Cl. 92—13.4 **4 Claims**



A piston and cylinder device has an adjustable stop arrangement for limiting the stroke of the piston. This adjustable stop arrangement comprises a casing and a plurality of stop elements located in said casing in alignment with each other and with a piston-rod-like member associated with the piston. The stop elements are removable from the casing and have two positions therein in one of which they embrace said piston-rod-like member so as not to obstruct movement of it and of the piston and in the other of which they obstruct movement of the piston-rod-like member. By re-arranging the stop elements in the casing the permitted stroke of the piston can be increased or decreased as required.

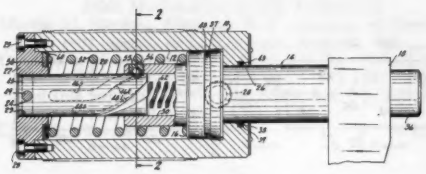
3,605,568
HYDRAULIC ACTUATOR WITH CENTER LOCK
Donald L. Nepp, San Pedro, Calif., assignor to Western Hydraulics, Inc., Anaheim, Calif.
Filed Sept. 15, 1969, Ser. No. 857,833
Int. Cl. F15b *15/26*
U.S. Cl. 92—24 **10 Claims**

A hydraulic actuator having a main piston movable to extended and retracted extreme positions of operation and provided with a center lock in a position intermediate the extreme positions. The lock is located internally of the piston for compactness and a locking-unlocking piston is provided for moving the main piston to its center locked position by abutting a part movable with the main piston, for movement in one direction only. Actuators may be mounted in face-to-face pairs to secure movement in opposite directions to the dead center position, or a single actuator may include a working surface on the



main piston for moving it to its dead center locked position in the direction opposite to the direction of movement by the auxiliary piston. Spring biased detent means hold the locking elements in unlocked position against involuntary, random movements.

3,605,569
FLUID FORCE APPLYING DEVICE
Donald W. Sessody, Milwaukee, Wis., assignor to Allied Power Industries, Inc., Milwaukee, Wis.
Filed Jan. 6, 1970, Ser. No. 871
Int. Cl. F01b *3/00;* **F16h** *25/12*
U.S. Cl. 92—33 **8 Claims**



A force applying device having a piston and cylinder assembly, a guide member positioned in the cylinder and slidably engageable with a bore provided in the piston. A pair of non-intersecting cam slots provided in one of said guide member and piston assembly and a cam follower provided in the other of said guide member and piston assembly, the cam follower being selectively engageable with one of said cam slots to guide said piston assembly in its movement in said cylinder, and a first return spring provided between said cylinder and piston assembly and a second return spring provided between said guide member and said piston assembly. The first and second springs are seated on thrust bearings provided at one end of each spring.

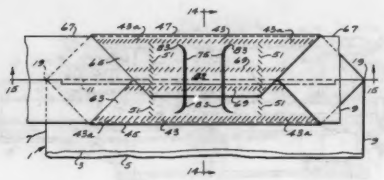
ERRATUM

For Class 92—187 see:
Patent No. 3,605,602

3,605,570
METHOD OF MAKING A PLASTIC BAG WITH HANDLE
Ralph C. Goodwin, Wayzata, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.
Original application Oct. 25, 1968, Ser. No. 770,708, now Patent No. 3,514,033, dated May 26, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,926
Int. Cl. B31b *49/04*
U.S. Cl. 93—35H **22 Claims**

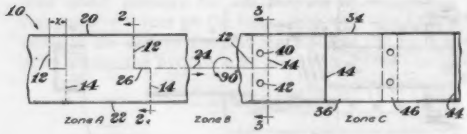
A plastic bag having a bottom closure which may be a valved diamond-fold or satchel bottom closure) and a

diamond-fold or satchel top closure in which the side flaps of the top closure are provided with a pair of slits extending alongside one another, the portion of the side flaps between these slits being free of the underlying



portion of the top closure and constituting a handle, and a method of making such bags involving formation of the slits in the side flaps after they have been folded over and sealed together.

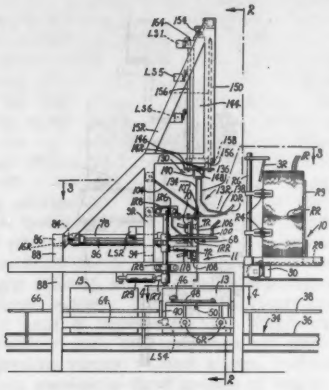
3,605,571
PROCESS FOR MANUFACTURING LIP BAGS
Oliver R. Titchenal, Berea, Ohio, assignor to The Dow Chemical Company, Midland, Mich.
Filed Mar. 2, 1970, Ser. No. 15,453
Int. Cl. B31b *49/04*
U.S. Cl. 93—35R **10 Claims**



A process for manufacturing lip bags from continuous lengths of flattened tubular film is disclosed. Exemplary of the process is where the film is perforated along first and second offset lines extending inwardly from opposite edges of the film, and which terminate at the film center line. In addition, a cut is made along the center line in the region between the offset lines. The film is then rotated or displaced 90 degrees such that the perforation lines now reside on opposed faces of the film, respectively, and the cuts are now located along the film edges. Cross-seals are subsequently formed, and the film separated into parts such as by tearing along the perforations. Each such part comprises a bag having an offset lip portion and a bottom end closed by the indicated cross-seal. The process is essentially scrapless and desirably permits the continuous manufacture of lip bags.

3,605,572
DIVIDER INSERTING MACHINE
Edward J. Derderian, 1735 Ventura, Fresno, Calif. 93721
Filed June 30, 1969, Ser. No. 837,670
Int. Cl. B31b *11/74*
U.S. Cl. 93—37 **8 Claims**

A divider inserting machine particularly suited for use in delivering, forming and inserting dividers of the type commonly called H-dividers into erected and open containers, a feature of the machine being the utilization of a divider inserting head which partially folds a prescored, partially folded blank into an H-shaped divider

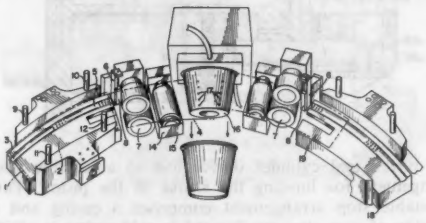


and subsequently inserts the divider into an erected and open container.

ERRATUM

For Class 93—39 see:
Patent No. 3,605,578

3,605,573
TUB MANDREL
Russell C. Buhle, Clarendon Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed July 14, 1969, Ser. No. 841,332
Int. Cl. B31c *7/06, 11/04;* B31b *1/06*
U.S. Cl. 93—39.3 **7 Claims**



A paper tub is formed on a rotating mandrel by winding two sections of paper onto the mandrel, one over the other. The sections of paper are held to the mandrel by a vacuum which is applied to the paper sections through orifices in the mandrel. After the paper is wrapped around the mandrel and glued together, pressured air is sent through some of the air lines to the orifices in the mandrel. The pressured air forces the tub off the mandrel to another position.

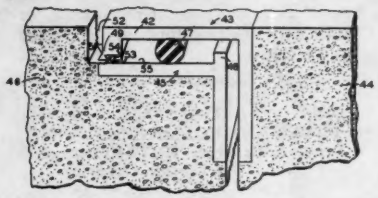
ERRATA

For Classes 93—41 and 93—52 see:
Patent Nos. 3,605,576 and 3,605,585

3,605,574
LIQUID IMPERVIOUS EXPANSION JOINT
Frank K. Hall, 1120 Country Club Drive, Findlay, Ohio 45840
Filed May 21, 1969, Ser. No. 826,409
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **17 Claims**

An expansion joint assembly having a seal in the form of a resilient right-circular cylinder having a rolling contact with superposed surfaces of cooperating relatively

moveable joint elements. The surfaces are advantageously planes oriented parallel to the direction of relative movement. Where the joint is subject to loads, as in roadway

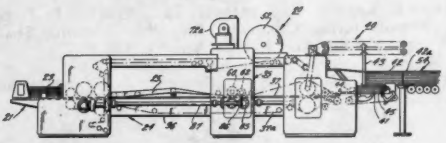


joints, the seal cylinder is preloaded to the order of the maximum anticipated loading to minimize its deflection when loaded by vehicles riding across its surface.

3,605,575
ROAD SURFACE MARKINGS
Hans Stevanon, 9030 Abtwil, Giessen, Switzerland
Filed Feb. 28, 1969, Ser. No. 803,331
Claims priority, application Switzerland, Mar. 1, 1968, 3,267/68
Int. Cl. E01c *21/00*
U.S. Cl. 94—22 **1 Claim**

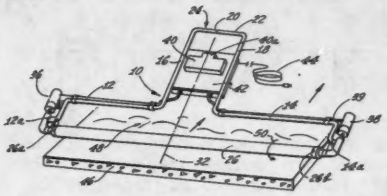
The present invention is a road surface marking, which is different from the markings hitherto known, by forming of a colored coating which, in the manner of a tattoo, is applied to a deep down-reaching adhesive or substrate area having a porous formation.

3,605,576
FOLDER-TAPER
Albert F. Shields, Forest Hills, N.Y., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.
Filed June 13, 1969, Ser. No. 832,976
Int. Cl. B31b *1/72*
U.S. Cl. 93—41 **6 Claims**



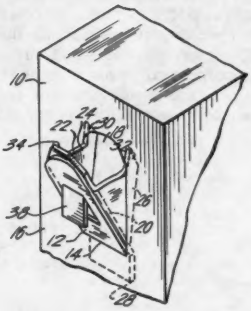
Apparatus for producing corrugated boxes is provided with continuous folding belts which convey a flat box blank forward and simultaneously, but gradually, fold the outer panels of the blank inward. After the outer panels are completely folded and while the folded blank is still being moved forward by the folding belts, tape is applied to the folded blank to produce a folded tubular box. Immediately after application of the tape, the folded tubular box is delivered to a squaring section, where a series of slaps or blows are directed against the trailing edge of the folded tubular box, with such slapping being done at a time before the glue on the tape has an opportunity to set to a condition where straightening will be impeded.

3,605,577
CONCRETE AND CEMENT PLANERS
Frank C. Bik, 7860 Michigan Drive, Citrus Heights, Calif. 95610
Filed June 2, 1969, Ser. No. 829,673
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 **1 Claim**



A concrete and cement planer comprised of a bifurcated frame between the extremities of the arms of which is rotatably disposed a roller member. Means are provided to apply substantially identical torque to each end of the roller member to cause rotation thereof in the same direction, the actuation of said means being controlled from a central location on the frame. The planer may be constructed small enough to be moved and operated by one person, or it may be made of such size for highway concrete laying as to acquire mounting on a vehicle frame.

3,605,578
DISPENSING BOXES AND METHODS AND MEANS FOR MANUFACTURE THEREOF
Martin M. Sternau, Flushing, N.Y., assignor of fractional part interest to Leo Stanger, Summit, N.J.
Original application Oct. 21, 1966, Ser. No. 593,611, now Patent No. 3,484,034, dated Dec. 16, 1969. Divided and this application Nov. 10, 1969, Ser. No. 871,315
Int. Cl. B31b *49/02, 1/14, 1/90*
U.S. Cl. 93—39R **9 Claims**

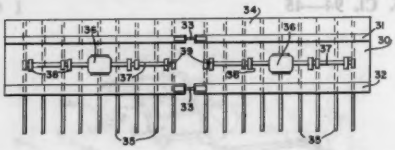


Methods and apparatus for making a container having a tab projecting downward from an upstanding flap defined by partly-penetrating perforations following an inverted U-shape cut made in the wall of the container.

3,605,579
ANTI-SKID SURFACE TEXTURING AND GROOVE FORMING EQUIPMENT FOR USE IN CONCRETE ROADS
Carl J. Heltzel, 523 Country Club Drive, Warren, Ohio 44484
Filed Dec. 11, 1968, Ser. No. 782,898
Int. Cl. E01c *19/43*
U.S. Cl. 94—45 **8 Claims**

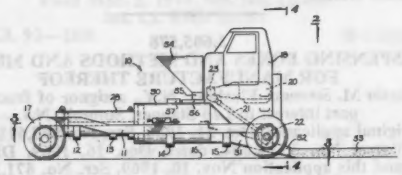
Laterally spaced freely-rotating or powered discs on a concrete road making machine displace the stones in the

concrete mix from linear areas in the slab where non-skid grooves are to be subsequently formed while the concrete is still in a plastic state by the tines of a drag or float or the tines of a rotary brush, which drag, float or



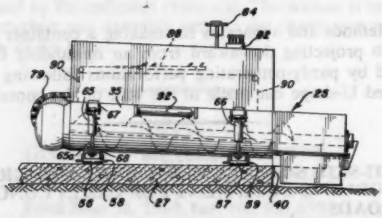
brush are carried on an independent vehicle following the conventional concrete road machine, which vehicle may have supporting wheels running on side forms or have caterpillar endless tracks in the case of formless pavers.

3,605,580
MOBILE EXTRUDER FOR FORMING STREET CURBS
Bernard Miller, 1663 Veteran Ave., Los Angeles, Calif. 90024
Filed June 26, 1969, Ser. No. 836,764
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 **8 Claims**



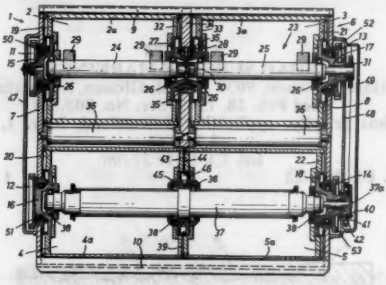
A mobile extruder is disclosed herein for laying a continuous strip of concrete or cement product in the shape of a curb onto a street surface. Self-leveling mechanism is carried on the extruder maintaining the extruding orifice level with respect to the street surface and sensing devices are incorporated into the mechanism for detecting non-level surface conditions and for actuating the mechanism to compensate for such conditions.

3,605,581
CONCRETE FORMING MACHINE
Blaine Heaton, 411 Keith Ave., Crystal Lake, Ill. 60014
Filed June 2, 1969, Ser. No. 829,185
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 **10 Claims**



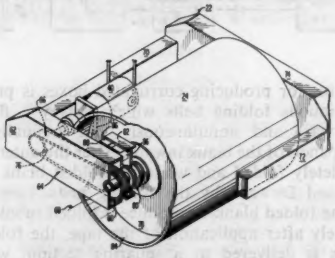
A concrete distributing machine for slip forming curb and gutter along a slab, including a steerable, driven carrier frame with a trough for concrete at the forward end. A screw moves the concrete transversely from the trough into the open bottomed well at the side. A slip form extends rearwardly from the trailing edge of the well. Adjustable supports for the trough permit adjustment of the pitch and height of the slip form. The carrier frame for the machine has steerable drive wheels at each end to enable holding accurate width dimensions of the formed concrete, particularly around curves. The lateral position of the slip form at the bottom of the well is adjustable.

3,605,582
PAVEMENT ROLLING MACHINE
Benno Kaltenegger, 77/79 Kurhausstr., 5202 Hennef (Sieg), Germany
Filed Feb. 26, 1970, Ser. No. 14,360
Claims priority, application Germany, Feb. 28, 1969, P 19 10 407.5
Int. Cl. E01c *19/28*
U.S. Cl. 94—50V **7 Claims**



A pavement rolling machine has a pair of front rolls coaxially aligned with a frame member therebetween and centrally located unbalanced shafts in each of the front rolls which when driven cause vibration in the front rolls. A rear pair of rolls is coaxially mounted on a common shaft with a minimal gap therebetween. The left and right sets of rolls can be driven independently of each other and the strip of pavement which does not come in contact with the front rolls due to the gap therebetween caused by the centrally located frame member, does come in contact with the rear rolls having a minimal gap therebetween to produce a smoother pavement.

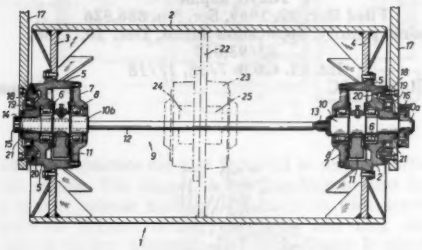
3,605,583
VIBRATORY ROLLER COMPACTING APPARATUS AND METHOD
John E. Keppler, San Antonio, Tex., assignor to Tampo Manufacturing Company, Inc., San Antonio, Tex.
Filed Apr. 1, 1969, Ser. No. 812,144
Int. Cl. E01c *19/28*
U.S. Cl. 94—50V **16 Claims**



A self-propelled vibratory machine including a frame resiliently mounting a compacting roller for rotation, and eccentric means, rotatable about the roller axis, for vibrating the roller. A variable speed hydrostatic transmission

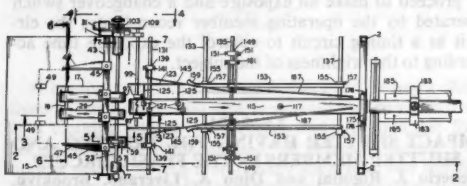
including a reversible, variable displacement pump in closed-loop fluid communication with a fixed displacement motor is in continuous driving relationship with the eccentric means and is operable to control the speed and direction of rotation thereof. A control linkage automatically correlates the direction of rotation of eccentric means with the translating direction of travel of the machine. Positive braking of the eccentric means, in approximately three revolutions thereof, minimizes the period of resonance between the frame and the vibrating roller.

3,605,584
VIBRATORY ROAD ROLLER
Benno Kaltenegger, Kurhausstrasse 77–79, Hennef, Sieg, Germany
Filed Mar. 19, 1969, Ser. No. 808,497
Claims priority, application Germany, Mar. 22, 1968, K 60,719
Int. Cl. E01c *19/28*
U.S. Cl. 94—50R **6 Claims**



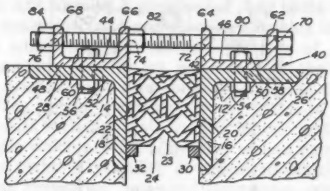
This disclosure provides a vibratory road roller including a roller drum having transversely disposed walls located adjacent the ends thereof. Housings are fixedly mounted within centrally located openings of the transversely disposed walls. A short shaft extends coaxially through each of the housings and are rotatably mounted therein. An eccentric weight is mounted on each of the coaxially located shafts within the housings. Bearing members located on each side of the eccentric weights rotatably support the short shaft sections. A stub shaft section interconnects the short shaft sections with each other to effect movement in response to the means for driving the said road roller.

3,605,585
APPARATUS FOR THE MANUFACTURE OF BOXES
Fred Borders, 1415 Wadsworth, Florissant, Mo. 63031
Filed June 11, 1969, Ser. No. 832,060
Int. Cl. B31b *1/36*
U.S. Cl. 93—52 **6 Claims**



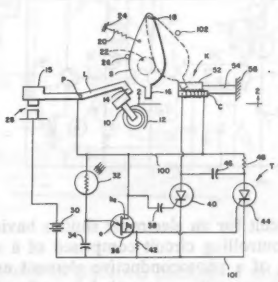
Apparatus for folding and gluing cardboard box blanks of different sizes and of irregular die cut shape as well as those of regular slotted shape, including means for stream feeding the box blanks at a relatively slow speed, applying glue to the flaps, and then feeding the blanks into the folding section at higher speed, the folding section comprising a conveyor belt, a hold-down bar adjustably spaced vertically thereabove to accommodate various flute thicknesses while applying sufficient pressure to the blanks to prevent slipping of the latter on the belt, the folding section also comprising a first pair of upwardly and transversely inwardly sloping folding rods arranged to underlyingly engage the side panels of the box blank to fold them upwardly and a second pair of downwardly and transversely inwardly sloping folding rods to fold the outer panels downwardly against the inner panels, said rods being transversely adjustable to accommodate different sizes of boxes and to provide for sequential downfolding of the glue coated flap and the opposite panel, and a compression section comprising opposing vertically spaced belts supported against the box surfaces by opposing pressure rollers.

3,605,586
PREFABRICATED SEALING SYSTEM
Thomas C. Bowman, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Oct. 29, 1968, Ser. No. 771,439
Int. Cl. E01c *23/02*
U.S. Cl. 94—51 **4 Claims**



An apparatus for prestressing a resiliently yieldable seal adhesively bonded to opposed faces of a pair of angle members comprising a pair of spaced apart channel members detachably mounted on the angle members. Openings are provided in leg portions of the channel members are receiving a bolt extending therethrough and spaced above the angle members. A nut is secured to one of the legs in alignment with the openings for receiving the threaded portion of the bolt. Rotation of the bolt effects relative movement between the angle members to adjustably prestress the seal therebetween.

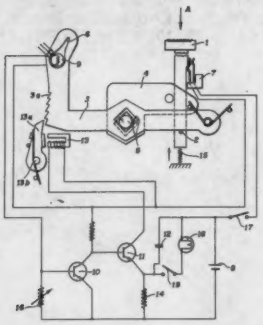
3,605,587
FRICTIONALLY HELD IMPACT TYPE SHUTTER
Frank Henry Speckhart, Knoxville, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 3, 1968, Ser. No. 742,385
Int. Cl. G03b *7/03, 9/10*
U.S. Cl. 95—10C **3 Claims**



In an automatic shutter control arrangement for a camera, the shutter is opened by an impact imparted by a spring loaded driver controlled by a shutter release

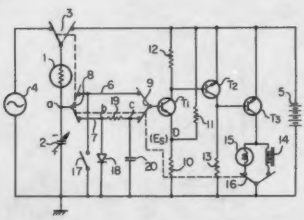
lever. The shutter is held open by frictional engagement with an electromagnetic keeper device. Actuation of the shutter release lever also energizes a timing circuit which causes timed de-energization of the keeper device to release the shutter. A photosensitive device in the timing circuit controls the exposure time in accordance with the scene brightness.

3,605,588
PHOTOGRAPHIC CAMERA WITH ELECTRONICALLY CONTROLLED LENS DIAPHRAGM
Wolfgang Ort, Stuttgart-Bad Cannstatt, and Clemens Höpfner, Stuttgart-Wanger, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 29, 1968, Ser. No. 779,945
Claims priority, application Germany, June 25, 1968, P 17 72 718.3
Int. Cl. G03b *7/08, 9/06*
U.S. Cl. 95—10 **3 Claims**



In order to minimize the size of the power supply for an electromagnetic exposure control, the pull-in solenoid current is supplied by a capacitor, while the holding current, which is substantially less than the pull-in current, is supplied conventionally.

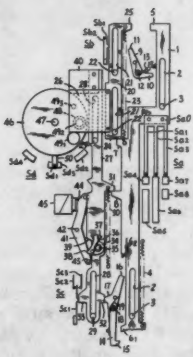
3,605,589
WARNING CIRCUIT FOR AN ELECTRONIC SHUTTER
Masaji Minegishi, Yokohama-shi, and Asao Hayashi, Tokyo, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan
Filed Feb. 14, 1969, Ser. No. 799,340
Claims priority, application Japan, Feb. 20, 1968, 43/10,263
Int. Cl. G03b *7/08*
U.S. Cl. 95—10C **10 Claims**



Warning circuit for an electronic shutter having an exposure time controlling circuit comprised of a series circuit consisting of a photoconductive element exposed to the light and a capacitor connected in series thereto, a switching circuit connected to the series circuit to be controlled thereby, shutter actuating means connected to the switching means, a D.C. source connected to the series circuit and the switching circuit, and warning means selectively connectable to the switching circuit in place of the shutter actuating means. An A.C. source is selectively connectable to the series circuit in place of the D.C. source when the warning means in connected to the switching circuit in place of the shutter actuating means.

A diode is connected in parallel to the capacitor when the A.C. source is connected to the series circuit so as to apply half wave A.C. voltage to the capacitor, and a smoothing circuit is connected to the capacitor for smoothing the half wave A.C. voltage supplied from the capacitor so that the switching circuit is controlled properly by comparing the smoothed voltage from the smoothing circuit with a reference voltage.

3,605,590
ELECTRONIC SHUTTER FOR AUTOMATIC EXPOSURE CONTROL
Kiyoshi Kitai, 54 Tomihisa-cho, Shinjuku-ku, Tokyo, Japan
Filed Dec. 19, 1969, Ser. No. 886,526
Claims priority, application Japan, Dec. 20, 1968, 43/93,017
Int. Cl. G03b *7/08, 17/18*
U.S. Cl. 95—10C **8 Claims**

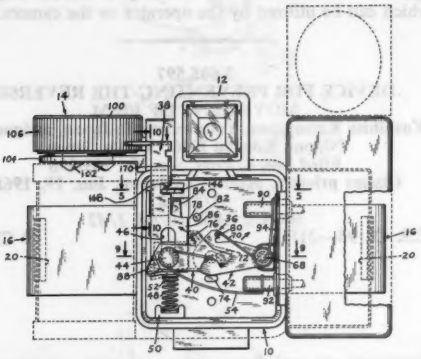


During an initial increment of movement of the operating member of an electronic shutter and before an exposure starts, an electric circuit senses the brightness of the subject to be photographed. If the brightness of the subject is too high or too low for satisfactorily taking a picture with the aperture that has been selected, further movement of the operating member is blocked and a corresponding lamp is lighted to indicate excessive or insufficient brightness. If the brightness is within allowable limits, movement of the operating member is permitted to proceed to make an exposure and a changeover switch operated by the operating member reconstitutes the circuit as a timing circuit to control the exposure time according to the brightness of the subject.

3,605,591
IMPACT SHUTTER HAVING THE TRIPPING AND SHUTTER MEMBERS IN THE FLASH CIRCUIT
Venerio J. Rigolini and Dino A. Liverano, Brooklyn, N.Y., assignors to Whitehouse Products, Inc., Brooklyn, N.Y.
Filed June 6, 1969, Ser. No. 831,016
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 **14 Claims**

A photographic camera having an impact shutter mechanism including a tripping member, a shutter and a flash circuit in which both the tripping member and the

shutter comprise flash contacts for closing the circuit a predetermined time prior to maximum shutter opening. The springs for operating both the tripping member and the shutter comprise electrical conductors in the flash circuit, and the circuit is closed when the tripping member is in contact with the shutter. Both members are coated with silver to insure good electrical conductivity. Addi-



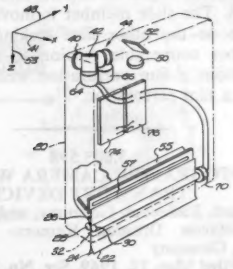
tional conductors are also provided in certain portions of the circuit. The impact shutter mechanism also includes a shutter release member which coacts with a metering pawl to prevent double exposures and lock the film against further winding before each picture is taken after a predetermined amount of unexposed film has been suitably framed for the next picture.

3,605,592

CORRECTED OPTICAL SYSTEM FOR SHALLOW CAMERA OR THE LIKE, AND COMPONENTS THEREOF

James G. Baker, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 23, 1968, Ser. No. 731,558
Int. Cl. G03b *37/02*
U.S. Cl. 95—15 **12 Claims**



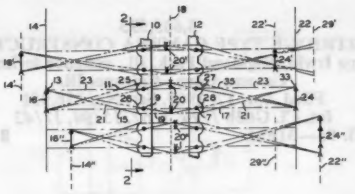
A compact scanning camera is disclosed. It has a short front-to-back dimension and is suitable for being carried in a clothing pocket. Both image and photographic film are moved synchronously past an exposure station. An optical system having a stationary shell lens and moving elements to provide for scanning and perspective distortion is incorporated into the camera. At least some of the moving elements pivot about the center of the shell lens. The shell lens provides certain optical corrections which, due to concentricity about the pivot point, are unaffected by movement of the pivoting components. Images are built up incrementally during scanning and are optically corrected throughout the scan.

3,605,593

OPTICAL APPARATUS INCLUDING A PAIR OF MOSAICS OF OPTICAL IMAGING ELEMENTS

Robert H. Anderson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed July 3, 1967, Ser. No. 650,862
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 **25 Claims**



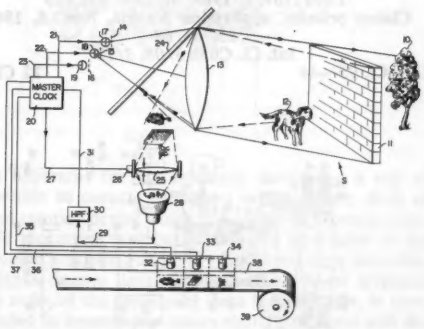
An optical apparatus for the transmission of light images is described including at least two mosiacs having a plurality of optical imaging elements, such as lenses or curved mirrors, supported in a two-dimensional array of elements and forming a plurality of light paths each containing image inverting and erecting elements in different mosiacs which transmit different portions of an image and recombine such image portions with their original relative orientation to reproduce the image of the viewed object. The optical elements may be lenses in a pair of lens mosaics including an inverting mosaic and an erecting mosaic which provide a plurality of lens pairs forming the light paths. A plurality of apertured plates are provided for preventing undesired light from reaching the composite image formed on the final image surface and the lens pairs are spaced so that adjacent image portions partially overlap and the overlapping areas coincide in the final image to provide a single, complete image. A cathode ray oscilloscope camera of extremely short length is formed using such an optical apparatus.

3,605,594

THREE DIMENSIONAL OPTICAL PHOTOGRAPHY PROJECTION SYSTEM

Hendrik Jurjen Gerritsen, 11 Halsey St., Providence, R.I. 02916

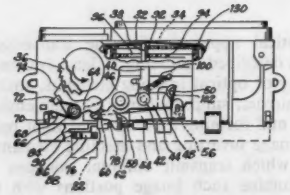
Filed Aug. 22, 1968, Ser. No. 754,543
Int. Cl. G03b *35/02, 35/16*
U.S. Cl. 95—18 **15 Claims**



The present specification discloses a three dimensional optical projection system which comprises two basic components. The first is the apparatus for taking cross sectional areas of a scene at different distances from the picture taking equipment and recording these cross sections

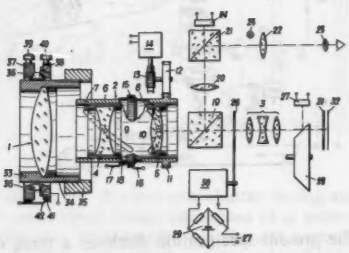
on a suitable medium such as a film. The second component is the apparatus for projecting the recorded images on a plurality of screens arranged in depth, with each screen having the capability of being either transparent or light scattering to the extent necessary to having an image reproduced thereon. The recorded images are projected on these screens in proper sequential order so that they reproduce the original scene in three dimensions.

3,605,595
CARTRIDGE TYPE CAMERA CONSTRUCTION
George Irwin, Highland Park, Ill., assignor to Imperial Camera Corp., Chicago, Ill.
Filed Apr. 17, 1969, Ser. No. 816,951
Int. Cl. G03b *1/14, 1/62, 15/04, 17/42*
U.S. Cl. 95—31FM **8 Claims**



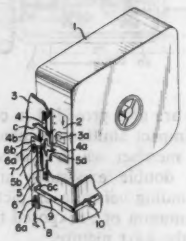
A camera construction of the type employing film usually contained in a cartridge and having perforations along its length for providing frame-by-frame indexing. The sensing finger is provided for engagement with the respective perforations, and upon engagement, the film winding means is locked. The camera shutter is unlocked to permit taking of a picture, and the picture taking action operates to disengage the finger from a film perforation to provide for indexing movement. The shutter actuating member is directly tied to a first pivoting member which moves a second pivoting member, the latter directly controlling both the finger and film advance locking means so that the movements of these elements are directly dependent upon each other.

3,605,596
CAMERA PROVIDED WITH A DEPTH-OF-FIELD CONTROLLER
Karl Vockenhuber, Otto Freudenschuss, and Eduard Keznickl, Vienna, Austria, assignors to Raimund Hauser, Vienna, Austria
Filed Nov. 4, 1969, Ser. No. 873,825
Claims priority, application Austria, Nov. 5, 1968, 10,763/68
Int. Cl. C03b *3/08, 3/12*
U.S. Cl. 95—44 **22 Claims**



A zoom lens has a varying depth of field for each focal length. Values are set corresponding to the near point and the far point of a desired object space. These values are set as resistances on either side of a bridge circuit. Connected on one side of the bridge circuit is a resistance value corresponding to the instant depth of field setting which is a combination of focal length and f-stop. Normally the bridge circuit is unbalanced in one direction but when the actual depth of field becomes smaller than the desired setting, the bridge circuit becomes balanced in the opposite direction thereby sending a circuit response which can be utilized by the operator or the camera.

3,605,597
DEVICE FOR PREVENTING THE REVERSE MOVEMENT OF FILM
Yoshihisa Katsuyama, Yokohama-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Jan. 8, 1969, Ser. No. 789,698
Claims priority, application Japan, Jan. 19, 1968, 43/3,242
Int. Cl. G03b *19/04, 1/42*
U.S. Cl. 95—31R **9 Claims**

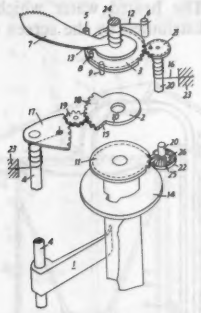


A device for regulating the rest position of film in a movie camera having claw means for intermittently feeding the film in forward and reverse directions employs a pair of oppositely arranged film locking members. Each film locking member has one end connected to the body of the camera and an opposite free end. The free end of each film locking member is formed to provide a pawl for entry into a film perforation and a laterally spaced portion which is cooperable with a slide member. The film locking members are biased so that their pawl members are normally urged toward the film for entry into the perforations. The slide member is movable to selectively engage one or the other film locking members at its slide member cooperable portion to selectively retract one pawl from a film perforation while the other pawl remains in a film perforation.

3,605,598
PHOTOGRAPHIC CAMERA WITH FILM TRANSPORT DEVICE
Hans Zimmet, Radebeul, Germany, assignor to Kombinat Veb Pentacon Dresden Kamera- und Kinowerke, Dresden, Germany
Filed Mar. 12, 1969, Ser. No. 806,652
Int. Cl. G03b *1/14*
U.S. Cl. 95—31R **5 Claims**

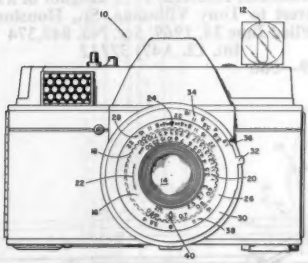
The housing of a photographic camera is provided with a film transport device having a film transport which moves the film a constant film length regardless of how much film has been wound onto the take up spool of the camera. The film transport lever can be moved in opposition to a restoring spring between an initial position determined by an initial stop mounted on the housing and a final position determined by an end stop mounted on the housing. A transport wheel is connected with a film key for the take up spool of the camera by way of a unidirectional drive means. The transport wheel is provided with a stroke control pin and a coupling pin each mounted near

its periphery. The coupling pin projects into the path of an edge of the film transport lever. A stop wheel is pivotally mounted and provided with a stop edge, the wheel is coupled with a scanning lever which scans the winding diameter of the take up spool and positions the stop wheel



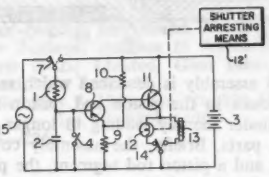
in accordance with the quantity of film on the spool. Spring means is provided which urges the stroke control pin of the transport wheel into contact with the stop edge of the stop wheel so that the distance between the coupling pin and the edge of the transport lever is adjusted.

3,605,599
CAMERA HAVING LENS APERTURE SETTING DEVICE
Carl Ort, Martin-Luther Str. 6, Stuttgart-Bad Cannstatt, Germany
Filed Mar. 21, 1969, Ser. No. 809,218
Claims priority, application Germany, July 31, 1969, K 61,913
Int. Cl. G03b *9/02*
U.S. Cl. 95—64 **1 Claim**



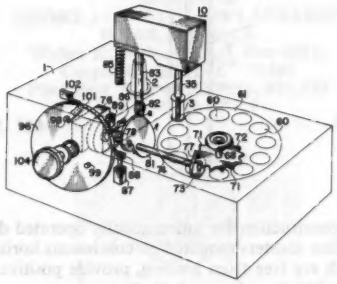
A camera adapted for flash photography having a diaphragm aperture setting ring with an index mark and aperture value scale associated therewith and a focus setting member. A second scale similar to the aperture value scale and a second index mark are associated with the focus setting member in such a manner that the proper aperture value will be shown on the second scale opposite the second index mark when the focus setting member is moved to the proper position corresponding to the distance between the camera and the subject. The aperture setting ring may then be positioned so that the first index mark is opposite the corresponding indicia upon the first scale.

3,605,600
COMBINATION WARNING AND SHUTTER TIMING CIRCUIT
Tadashi Morokuma, Tokyo, Japan, assignor to Olympia Optical Company, Ltd., Tokyo, Japan
Filed Oct. 21, 1968, Ser. No. 769,250
Claims priority, application Japan, Oct. 28, 1967, 42/69,276
Int. Cl. G03b *7/08*
U.S. Cl. 95—10C **6 Claims**



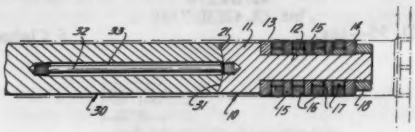
A camera shutter system having a control circuit capable of two operational modes. In one mode the control circuit responds to an A.C. signal that exceeds a threshold voltage representing excessive subject brightness as detected by a photoelectric device. The signal energizes a warning indicator. In a second mode the control circuit serves as a timing circuit which operates from a D.C. source for electromagnetically closing the camera shutter after a time constant interval dependent upon the circuit resistance of the suoject monitoring photoelectric device.

3,605,601
AUTOMATIC FILM DEVELOPING APPARATUS
Shigeru Okayama and Kunihiro Okayama, both of 4–11 Hanegi 2-chome, Setagaya-ku, and Hidehiko Takahashi, 952 Kita-machi, 3-chome, Kichijoji Musashino-shi, all of Tokyo, Japan
Filed Feb. 18, 1969, Ser. No. 800,232
Claims priority, application Japan, Feb. 27, 1968, 43/12,393; Mar. 6, 1968, 43/14,433
Int. Cl. G03d *3/08*
U.S. Cl. 95—89D **7 Claims**



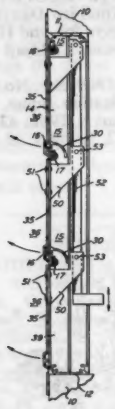
An apparatus for automatically developing a roll of film within its cassette includes a vertical rotary shaft of a spool rotating device which is fitted to the cassette. Cup-shaped processing tanks, corresponding in number to the developing processing steps, are positioned on a turntable. The tanks contain developer or washing water arranged in the order of the developing steps and each one, in turn, is rotated to beneath the rotary shaft. An ascent and descent device raises and lowers the spool rotary device so that at its bottom dead point the cassette is fully immersed in the developer or washing water of a tank. The spool rotary device includes a rotary direction reversal mechanism whereby the spool is alternately and repeatedly rolled up and back.

3,605,602
PISTON ROD ASSEMBLY
Henry K. Tyson and Karl W. Wikelski, Odessa, Tex., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed Nov. 19, 1969, Ser. No. 877,962
Int. Cl. F16j 1/14
U.S. Cl. 92—187 2 Claims



A piston rod assembly is described which reduces the operational stresses in the piston rod, piston rings and compressor cylinder thereby leading to longer operating lives for these parts. Briefly, the assembly comprises a piston segment and a piston rod segment, the piston segment having a plurality of piston rings mounted thereon along with two guide bushings which are in spaced apart relationship, and each of said piston segment and piston rod segment having mating substantially spherical end surfaces which are in end-to-end abutting relationship and connected by a threaded tension member.

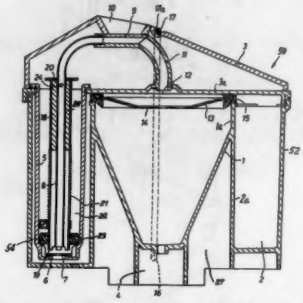
3,605,603
DAMPER CONSTRUCTION
Francis J. McCabe, Penns Park, Pa. (% Prefco Products, Inc., P.O. Box 421, Rte. 413, Buckingham, Pa. 18912)
Filed Nov. 12, 1969, Ser. No. 875,982
Int. Cl. F24f 13/06
U.S. Cl. 98—110 8 Claims



Damper construction for automatically operated dampers that utilizes shutters mounted on continuous horizontal hinges which are free from binding, provide positive sealing and provide stops for each shutter.

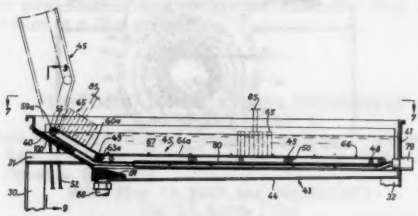
3,605,604
COFFEE MAKER WITH HEATER AND FILTER
Max Diebold, Eberhard Menge, Rudolf Hanschitz, and Helmut Humm, Reichenbach (Fils), Germany, assignors to Electrostar G.m.b.H., Reichenbach (Fils), Germany
Filed Apr. 10, 1970, Ser. No. 27,284
Claims priority, application Germany, Apr. 25, 1969, P 19 21 052.7
Int. Cl. A47j 31/057
U.S. Cl. 99—281 20 Claims

A coffee maker includes a centrally arranged filter support for receiving a filter element and a charge of coffee, with a container defining an annular space therearound for water which is closed by a cover which extends over the annular space and the top of the filter. A water heating tube is arranged within the annular space which includes a heater for heating the water which is delivered from the lower end of the tube through a relief valve connecting into the annular water space. The top of the tube extends from the annular space around the filter to an overhead discharge onto a screen arranged above the filter. The heated water which is discharged from the tube is distributed by the screen over the coffee



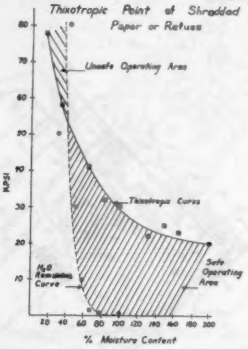
and permitted to filter downwardly into a receptacle which is located below the device. The water heating tube includes an electric coil heater therearound and it is arranged in a sleeve and separated from the annular water space by an annular packing which surrounds the heating tube. Entrance to the sleeve and the heating tube is through a relief valve which closes when the pressure of the water within the heating tube reaches a predetermined amount, but which opens again once the charge of heated liquid is discharged upwardly and over and into the charge of coffee arranged above the filter.

3,605,605
MACHINE FOR CONVEYING RESTRAINED FOLDED TORTILLAS LONGITUDINALLY THROUGH HOT OIL BATH TO FORM TACOS SHELLS
Edward L. Sanchez, Houston, Tex., assignor of a fractional part interest to Tony Villasana, Sr., Houston, Tex.
Filed June 24, 1969, Ser. No. 848,374
Int. Cl. A47j 37/12
U.S. Cl. 99—386 6 Claims



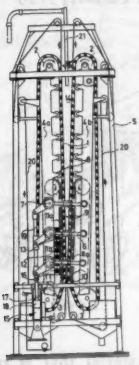
The disclosure is for best purpose of producing tacos shells comprised of processed, thin, pliable, round tortillas that are pre-folded substantially in half and placed in baskets each framed and of length to receive a succession (5 or 6) of V-shaped, mold folded tortillas transversely across hot oil bath and upon horizontally, longitudinally moving conveyor therein, the bath in length permitting a substantial plurality, as six baskets (30 or 36 tortillas), to be fully immersed therein at any instance. Thus five (or six) processed tacos shells emerge for every basket width of conveyor travel.

3,605,606
METHOD OF COMPRESSION OF REFUSE
Lawrence Skendrovic, West Mifflin, and Victor F. Koontz, Fairview, Pa., assignors to Eriez Manufacturing Company, Erie, Pa.
Filed Oct. 23, 1968, Ser. No. 769,944
Int. Cl. B30b *13/00*
U.S. Cl. 100—35 1 Claim



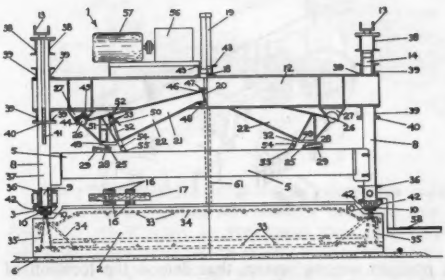
A process of compressing domestic refuse that is made up predominantly of paper wherein the total refuse is compressed at a pressure below its thixotropic point and above a point that the "spring-back" of the refuse becomes approximately constant.

3,605,607
BAND FILTER PRESS
Hans Gujer, Glattalstrasse 149, Rumlang, Zurich, Switzerland
Filed May 14, 1970, Ser. No. 37,162
Claims priority, application Switzerland, May 14, 1969, 7,382/69
Int. Cl. B30b *9/24, 5/04*
U.S. Cl. 100—118 17 Claims



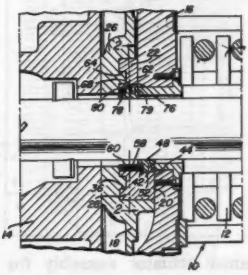
A band filter press of the type incorporating two revolving press bands, wherein at least one such press band is constructed as a filter press band. These press bands being arranged in such a manner that they form therebetween a filter press compartment which narrows or tapers in the feed direction of the press product undergoing treatment, this filter press compartment being laterally sealed by suitable sealing devices. Furthermore, the press bands are supported in a direction towards one another by suitable resilient or spring elements. According to important aspects of the invention, at least one of the press bands bears upon a support at least at the portion of the press region or zone which merges with the press-out gap located at the lower extremity of said filter press compartment. This support is subdivided into sections supported by the resilient elements and movable towards one another at least transverse to the feed direction of the aforesaid one press band, and wherein the resilient elements of each support section collectively are subjected to a pre-bias, the magnitude of which is always smaller than the forces exerted upon each support section by the press product during maximum permissible operating pressure.

3,605,608
PRESS MEANS
Edgar Edward Dagley, Birkenhead, North Island, Auckland, New Zealand, assignor to Automated Building Components (N.Z.) Limited, Glen Innes, Auckland, North Island, New Zealand
Filed July 7, 1969, Ser. No. 839,463
Int. Cl. B30b *1/08*
U.S. Cl. 100—226 11 Claims



A press in which a lower platen receives a truss or frame and associate multi-nail plates and an upper rectangular platen is pressed towards the lower platen by a single hydraulic platen and cylinder assembly which operates through a pair of lever assemblies which fulcrum on rollers on the upper platen towards the four corners thereof. The upper platen is movable on rails relative to the lower platen and has plates travelling under surfaces of the rails so that an uplift force during pressing is transmitted to such surfaces of the rails.

3,605,609
CHOKE JAW WITH REPLACEABLE WEAR SURFACE
Walter K. Whitlock, P.O. Box 4021, Corpus Christi, Tex. 78408
Filed Sept. 5, 1969, Ser. No. 855,533
Int. Cl. B30b *15/00*
U.S. Cl. 100—148 12 Claims



A working face insert for the choke jaw of a material press of the type wherein material is forced through an outlet choke structure defining a passage therethrough with which a plurality of choke jaws are operatively associated for varying the effective cross-sectional area of the passage formed through the outlet choke structure. The working face insert is supported from one of the

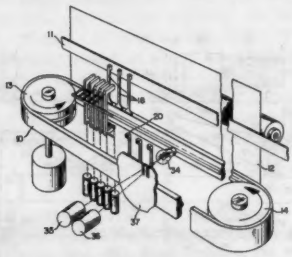
choke jaws in a manner whereby the working face insert comprises that part of the choke jaw defining a partial restriction of the throat structure passage. The working face insert is removably supported from the associated choke jaw in a manner such that the entire choke jaw need not be replaced or reconditioned when the working face thereof becomes worn. Instead, the working face insert may be removed and replaced by a new insert.

3,605,610

TYPE MEMBER POSITION SENSING SYSTEM IN A HIGH SPEED PRINTER

Earle B. McDowell, Clifford M. Jones, and Seymour M. De Puy, Waynesboro, Va., assignors to General Electric Company

Filed June 4, 1968, Ser. No. 734,500
Int. Cl. B41j *5/30*
U.S. Cl. 101—93 15 Claims



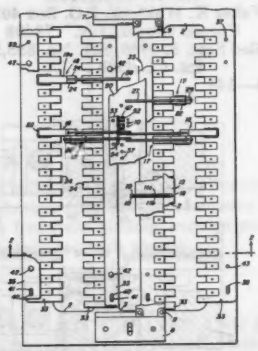
A position sensing system that detects the location of each element of a plurality of elements as they traverse a predetermined path. The system is disclosed in conjunction with a printing arrangement wherein the elements are the character bearing fingers on a continuous moving belt.

3,605,611

PRINT HAMMER AND ACTUATOR CONSTRUCTION FOR HIGH SPEED PRINTERS

Joseph Konkel and Frank H. Schaller, Lynnfield, Mass., assignors to Data Printer Corp., Boston, Mass.

Filed May 8, 1969, Ser. No. 822,985
Int. Cl. B41j *9/02;* H01f *7/14*
U.S. Cl. 101—93C 14 Claims



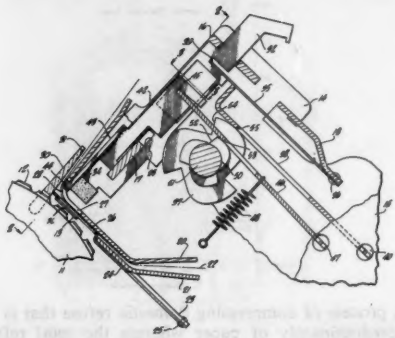
A print hammer actuator assembly for high speed printers. Two electromagnetically energized actuator constructions are provided, which are mechanically equivalent but of complementary geometry so that they can be located together in a manner facilitating individual removal of the actuators. The actuators are located in directions parallel to the line of print by alignment combs fastened to a base plate, and located in directions normal to the line of print by stop bars fastened to the base plate.

3,605,612

PRE-POSITIONING MEANS FOR PAPER AND RIBBON INKER IN SELECTIVE PRINTING MACHINES

John G. Clary, Pasadena, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Apr. 21, 1969, Ser. No. 817,767
Int. Cl. B41j *31/12;* B41k *1/40*
U.S. Cl. 101—96 5 Claims



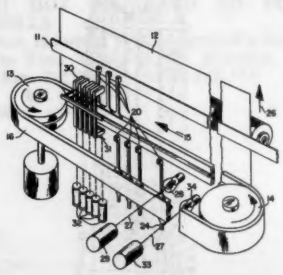
A presser device for moving a paper strip and printing ribbon at a controlled rate of speed against type members prior to striking movement of printing hammers whereby to reduce printing noise.

3,605,613

REINFORCED TYPE CARRIER BELT FOR IMPACT PRINTING APPARATUS

Seymour M. De Puy, Waynesboro, Va., and Donald G. Hebert, Rochester, N.Y., assignors to General Electric Company

Filed June 4, 1968, Ser. No. 734,499
Int. Cl. B41j *1/20*
U.S. Cl. 101—111 28 Claims



A belt of elastic material that is reinforced to provide a critical peripheral dimension. Precisely positioned, yet removable, type carrying members project from transverse slots in the belt.

3,605,614

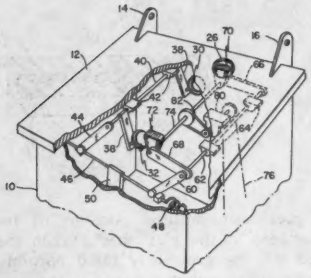
WORK SUPPORT WITH INTERCHANGEABLE CLOSURE AND SHEET REMOVAL MEANS

David M. Gilman, Brookline, and Louis Gilman, Newtonville, Mass., assignors to Graphic Equipment of Boston, Inc., Boston, Mass.

Filed May 9, 1969, Ser. No. 823,397
Int. Cl. B41f *15/20*
U.S. Cl. 101—126 12 Claims

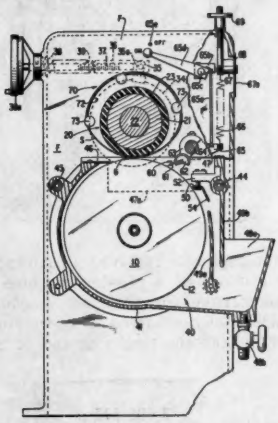
A silk screen process press has an aperture in its work surface on which the sheet to be printed is placed. A

closure member is movable between a position closing the aperture and a second position remote from the aperture. A drive mechanism is movable between a position in the aperture and a position remote from the aperture



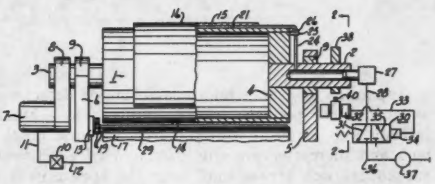
and the drive mechanism is positioned in the aperture after the printing operation is completed to engage the underside of the printed sheet and drive it laterally across the work surface in a removal operation.

3,605,615
PRINTABILITY TESTER
William F. Huck, 285 Gregory Road, Franklin Lakes, N.J. 07417
Filed June 25, 1969, Ser. No. 836,292
Int. Cl. B41f *9/04*
U.S. Cl. 101—153 **11 Claims**



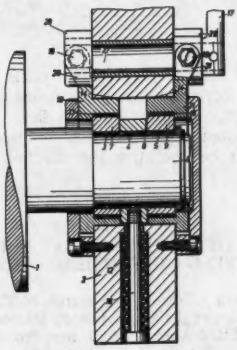
A machine for testing the printability of papers, inks and printing patterns, especially in gravure printing, wherein a rotating impression roll is displaceable to press a looped paper sample briefly against a rotating printing cylinder so as to imprint a single pattern on the sample, is provided with an eccentric sleeve mounting for the impression roll shaft and with actuating and control mechanisms which act upon the sleeve to displace the roll in precise, speed-independent relationship to the rotational position of the pattern to be test printed. The sleeve mounting provides for precise adjustment of the impression roll pressure. A force-limiting coupling protects against pressure overloads. Controls assure a single imprint irrespective of the moment or the duration of manual initiation of a printing test.

3,605,616
METHOD AND APPARATUS FOR PRINTING SURFACES HAVING LINE DEPRESSIONS
Ralph A. Pannier, McCandless Township, Allegheny County, Pa., assignor to The Pannier Corporation
Filed Sept. 8, 1969, Ser. No. 856,106
Int. Cl. B41f *13/10*
U.S. Cl. 101—216 **10 Claims**



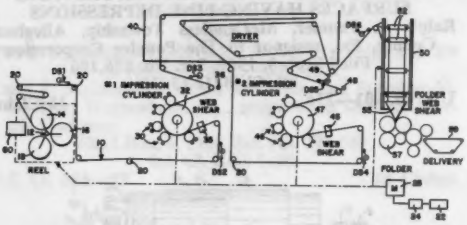
A heavy paperboard score mark printer for inflation under a flexible printing die to carry the print into and across the score mark or depression then deflate for re-inking the printing die when having a circular surface and synchronizing the inflating and deflating operations with the movement of the score mark under the inflated printer.

3,605,617
BLANKET CYLINDER BEARING FOR OFFSET PRINTING PRESSES
Erich Wieland, Wurzburg, Germany, assignor to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany
Filed Jan. 13, 1969, Ser. No. 790,756
Claims priority, application Germany, Jan. 27, 1968, P 16 11 302.3
Int. Cl. B41f *7/04, 13/28*
U.S. Cl. 101—218 **14 Claims**



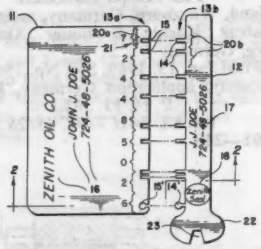
The invention relates to a blanket cylinder bearing of an offset printing press for the alternate throwing on and off from one or two cylinders by mounting the axle of the blanket cylinder at both ends in eccentric bushings.

3,605,618
REFLEX DETECTOR COUNTER AND MONITORING SYSTEM
Herman F. Clasen, 636 N. Main St., Germantown, Ohio 45327
Filed Nov. 14, 1968, Ser. No. 775,620
Int. Cl. B41f 33/14
U.S. Cl. 101—228 9 Claims



Apparatus for controlling web break detectors and associated components, and monitoring web breaks in moving web material, which detects the first break in a web and thereafter prevents detection of additional and subsequent web breaks until after the apparatus is reset, records each web break on a counter corresponding to its location along the web, and controls the web after a break has occurred.

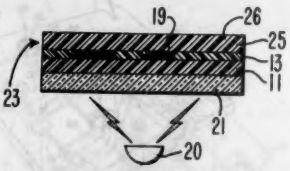
3,605,619
CREDIT CARD WITH INFORMATION BEARING EDGES
James B. Gilstrap, 8440 Thames St., Springfield, Va. 22151
Filed Sept. 25, 1968, Ser. No. 762,421
Int. Cl. B41l 45/02; B41n 1/00; G09f 3/02
U.S. Cl. 101—368 5 Claims



A credit card formed in two parts including a main part and a key part, each part having a specially formed field section, wherein the two field sections must be properly mated together for the credit card to appear correct and/or be operative for effecting a credit transaction.

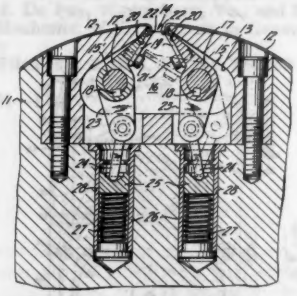
3,605,620
METHOD OF MAKING RELIEF PRINTING PLATES EMPLOYING INFORMED ABSORBING PICK SHEET
William J. Mueller, Webster, N.Y., assignor to Burroughs Corporation, Detroit, Mich.
Filed Aug. 4, 1969, Ser. No. 847,149
Int. Cl. B41c 3/06; B41n 1/00
U.S. Cl. 101—401.1 5 Claims

An improved method for processing a composing member having a heat sensitive polymer dispersion coating on a stable base such as plastic, using infrared radiation and no solvents or etchants to form a relief printing plate. Infrared absorbing indicia are placed in thermal contact with the coating and the coating is thereby selectively heated through the application of near infrared radiation. The coating, now having fused portions corresponding to the indicia, is placed in physical contact with a pick sheet and in thermal contact with a total infrared absorbing medium. The coating, the pick sheet and the total infrared absorbing medium are arranged successively outwardly from the infrared source.



The previously unfused portions of the coating fuse and adhere to the pick sheet. When the pick sheet is peeled off, the previously fused portions corresponding to the indicia, remain adhered to the base to form a relief printing member. The previously unfused portions are now fused to the pick sheet and may be used as an intaglio printing member, if desired.

3,605,621
PRINTING CYLINDER FOR HOLDING FLEXIBLE PLATES
Richard Woessner, Fairlawn, and Jack Bryer, Paramus, N.J., and Dominic Mascio, Bellrose, N.Y., assignors to Wood Industries, Inc., Plainfield, N.J.
Filed May 8, 1969, Ser. No. 822,872
Int. Cl. B41f 27/06
U.S. Cl. 101—415.1 1 Claim

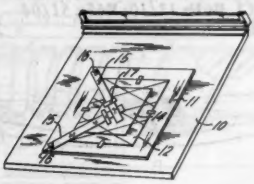


A clamping device for fastening a flexible printing plate on a plate cylinder of a printing machine as arranged in such a manner that the plates are as securely clamped and circumferentially registered for operation of the printing cylinder in both the clockwise and counterclockwise directions.

3,605,622
ALIGNMENT METHOD FOR PLATE AND OFFSET DUPLICATION PROCESSES
Ibraham E. R. Zarip, 41—42 42nd St., Long Island City, N.Y. 11104
Filed July 14, 1969, Ser. No. 841,327
Int. Cl. B41b 1/00; B41n 3/00
U.S. Cl. 101—426 3 Claims

A method for aligning a print in a photographic plate printing machine with respect to the edges of finished copy made in an offset duplicating machine is provided. This is achieved by fixing in place, photographing and making a printing plate of some arbitrary figure or art work, installing the plate in the offset duplicator and making at least one test print of smaller dimension than

the original print. The test print is placed on the plate making machine and aligned with the original work. This represents the alignment of the edges of the copy paper with respect to the position of the work on the plate

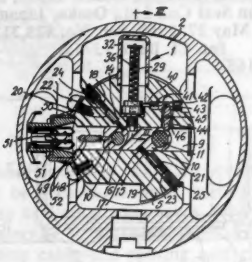


making machine. A transparent grid lined sheet is then placed over the test print to record the alignment and new plates and copy made therefrom will be in alignment with the copy paper edges.

3,605,623
SAFETY MECHANISM FOR ROTARY PROJECTILES

Paul André Théate, Liege, Belgium, assignor to Fabrique Nationale d'Armes de Guerre, Societe Anonyme, Herstal-lez-Liege, Belgium

Filed June 25, 1968, Ser. No. 739,846
Claims priority, application Belgium, July 10, 1967, 701,110
Int. Cl. F42c *9/02, 15/22*
U.S. Cl. 102—79 **7 Claims**



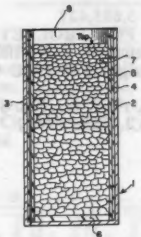
A safety mechanism for rotating projectiles comprising a member carrying a portion of the conventional pyrotechnic train and designed to be shifted, after being released by a locking device, under the action of the centrifugal force during the flight of the projectile.

3,605,624
CASTABLE ILLUMINANT FLARE COMPOSITION AND METHOD FOR MAKING FLARE BODY THEREWITH

Vern Thomas Dinsdale and Russell Reed, Jr., Brigham City, and Robert E. Meyer, North Ogden, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Feb. 10, 1969, Ser. No. 797,906
Int. Cl. C06b *1/10*
U.S. Cl. 102—37.8 **14 Claims**

A flare body for a parachute type flare providing superior brilliance and sustained output of illumination even after 14 days of 24-hour temperature cycling between —65 and 165° F. is obtained by means of a novel, castable illuminant flare composition comprising an uncured, high oxygen content liquid polymeric binder material, particularly a liquid saturated polyester polymer/liquid epoxy resin system, which is loaded into a flare body casing lined on its inner bottom and side surfaces with at least partially cured liner material comprising the binder material and further comprising an anchor sheet material bonded completely on its inner surface to the outer surface of the liner and on its outer surface to the inner casing wall essentially only by a relatively



narrow anchor strip of material running from the top to the bottom of the casing. The loaded casing and its contents then are heated to cure the polymeric binder material in the composition, liner and anchor strip.

3,605,625
CURVE LINERS

Odon Steven Bencsics, Montreal, Quebec, Canada, assignor to Tamper Inc., West Columbia, S.C.

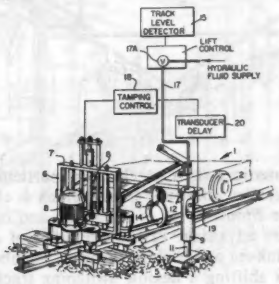
Filed Sept. 15, 1969, Ser. No. 857,902
Claims priority, application Great Britain, Sept. 27, 1968, 46,105/68
Int. Cl. E01b *35/02, 33/02*
U.S. Cl. 104—8 **17 Claims**

A method and apparatus for the alignment of railroad track which provides a smooth transition from tangent to circular curve track through a spiral curve and which enable the apparatus to be used in lining on a single pass through a section of track. The method comprises steps of measuring parameters of a length of track, establishing from the measured parameters a curve form to which the length of track approximates and which provides a constant rate of change of curvature and adjusting for some point in the length of track the position of the point to lie on the established curve form. According to a preferred embodiment disclosed the required curve form is determined by the measurement of parameters determinative of the curvature at two points in the length of track.

3,605,626
BALLAST SCARCITY INDICATOR

John Kenneth Stewart, Columbia, S.C., assignor to Tamper, Inc., West Columbia, S.C.

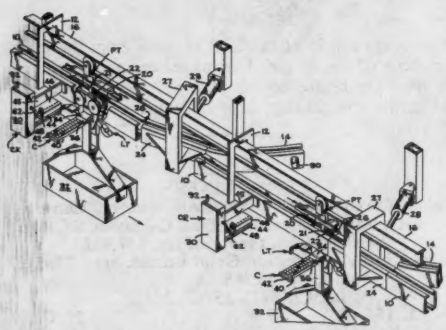
Filed Aug. 12, 1969, Ser. No. 849,428
Int. Cl. E01b *27/17*
U.S. Cl. 104—12 **1 Claim**



There is provided a method and apparatus for levelling railroad track to improve the packing of ballast under

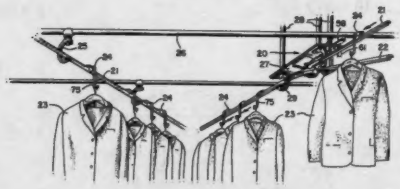
the ties of the track. The improvement comprises determining the weight of the track carried by the ballast at a point in the track and continuing to pack ballast under the tie at that point until substantially all the weight of the track at that point is carried by the ballast.

3,605,627
ESCORT MEMORY FOR TROLLEY CONVEYOR
Ronald F. Homeier, Plainfield, and William A. Simmons, Indianapolis, Ind., assignors to FMC Corporation, San Jose, Calif.
Filed July 23, 1969, Ser. No. 844,025
Int. Cl. B65g *17/42*
U.S. Cl. 104—88 **14 Claims**



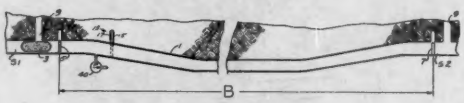
A trolley conveyor is provided with a fluid operated code reading unit adjacent each of a plurality of switch gates that are movable to divert a trolley from the main track to a spur track. Each trolley carries a destination coding or escort memory unit which is preset to match the code of one of the code reading units. Each code reading unit has its own fluidic sensing and logic circuit. When the destination code matches, the logic circuit of the code reading unit moves the adjacent switch gate to divert the trolley onto the spur track.

3,605,628
CONVEYOR TRACK SWITCH
John H. McElroy, 14 E. Roosevelt Circle, Red Bank, N.J. 07701
Filed Mar. 22, 1968, Ser. No. 715,414
Int. Cl. B61f *3/00;* **B61l** *11/02*
U.S. Cl. 104—103 **7 Claims**



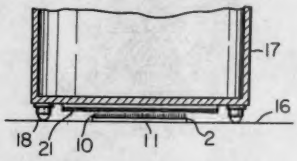
A semi-automatic switch mechanism particularly for monorail type trolley conveyor tracks which is characterized by extreme simplicity of construction and operation. The switch takes advantage of the operation of a spring-loaded toggle linkage and a pivoted shifter member struck by a trolley for shifting a flexible switching track section into alignment selectively with either of two angularly disposed track sections, such as a main track section and a branch section.

3,605,629
HIGH SPEED GROUND TRANSPORTATION SYSTEM
Lawrence K. Edwards, 301 Santa Rita Ave., Palo Alto, Calif. 94301
Filed Sept. 3, 1969, Ser. No. 854,887
Int. Cl. B61b *13/10;* **B65g** *51/04*
U.S. Cl. 104—138 **21 Claims**



A high-speed ground transportation system comprises a duct through which a vehicle is adapted for propulsion as a free piston. Entrance and exit valves are provided adjacent the ends of the duct and the section of the duct between the valves is preevacuated. On opening the entrance valve, air pressure forces the vehicle into the section and after the vehicle has passed the entrance valve and a predetermined amount of propulsive air has entered the duct behind the vehicle, the valve is closed. A cut-off valve is provided in the duct downstream from the entrance valve for preventing the propulsive air admitted behind the vehicle from entering the main body of the duct. The exit valve opens when the pressure ahead of the vehicle reaches a predetermined pressure.

3,605,630
DEVICE FOR TRANSPORTING A CART
Teruya Tsuruzawa, Suita-shi, Osaka, Japan, assignor to Nihon Seal Co., Ltd., Osaka, Japan
Filed May 27, 1969, Ser. No. 828,312
Int. Cl. B61b *13/12*
U.S. Cl. 104—165 **4 Claims**

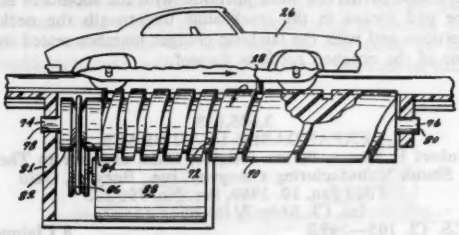


A device for transporting carts, provided on the bottom surface with pile, engaging pile provided on the top surface of a conveyor belt; supported by the surface of the working floor of a shop. The conveyor belt is a flexible, endless belt system with pulleys, guide rolls, drive pulleys and power source. The guide and driving systems provided two parallel tracks for transporting the carts in two directions opposite to each other. The drive guide systems are submerged below the floor level, so not to obstruct movement of the carts when off the conveyor belt tracks. As the carts are moved to straddle the conveyor belt, the pile on the carts will engage the upper pile of the conveyor belt. Carts are thus moved in one direction or the other.

3,605,631
MOVING APPARATUS FOR A TOY VEHICLE
Thomas E. See, Huntington Beach, Arthur S. Woodward, Sylmar, and Janos Beny, Manhattan Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 5, 1968, Ser. No. 781,571
Int. Cl. B61b *13/12;* **A63h** *29/00*
U.S. Cl. 104—167 **10 Claims**

Apparatus for briefly propelling an unpowered toy vehicle so it can then coast around a track, comprising

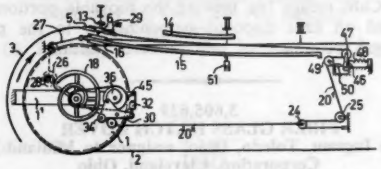
a rapidly rotating screw for engaging a projection on the vehicle to move it along the track. The screw has a variable pitch that is greatest at downpath portions, so the vehicle is accelerated even though the screw may turn at a constant speed.



3,605,632
OVERHEAD CABLEWAY

Ulrich Furrer, Kriens, Switzerland, assignor to Bell Maschinenfabrik AG, Kriens, Switzerland

Filed Apr. 22, 1970, Ser. No. 30,673
Claims priority, application Switzerland, Apr. 22, 1969, 6,039/69
Int. Cl. B61b *7/10*
U.S. Cl. 104—178 5 Claims

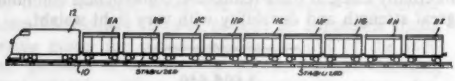


An overhead cableway with a circulating cable and carriages to be accelerated by a starting device and to be coupled to said circulating cable. With starting a carriage, said starting device being operatively coupled to said circulating cable and moving said carriage. A tensioning device in said starting device for measuring relative movement between said carriage and said circulating cable when the carriage is coupled both to the starting device and to the circulating cable.

3,605,633
STABILIZED UNIT TRAIN

William R. Townsend, Old Greenwich, Conn., assignor to Flume Stabilization Systems, Inc., Hoboken, N.J.

Filed Mar. 25, 1969, Ser. No. 810,221
Int. Cl. B61d *15/00*
U.S. Cl. 105—1 8 Claims

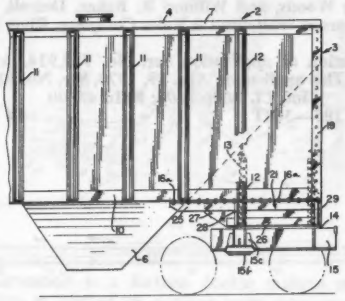


A unit railroad train having a series of like cars, the train being subject to resonance effects which make it difficult for the train to attain optimum speed. To overcome this drawback, two or more cars in the series thereof at separated points therein are provided with stabilizers which take the form of liquid storage tanks wherein liquid is transferred from one section of the tank to another in a direction transverse to the movement of the train, the rhythm of liquid transfer being out of phase with the undulation of the unit train at its natural period of vibration, thereby interrupting this period and making it possible for the train to reach higher speeds without resonance effects.

3,605,634
COVERED HOPPER CAR END CONSTRUCTION

Kent N. Johnson, South Holland, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 30, 1968, Ser. No. 787,942
Int. Cl. B61d *5/00, 7/00, 17/06*
U.S. Cl. 105—248 13 Claims

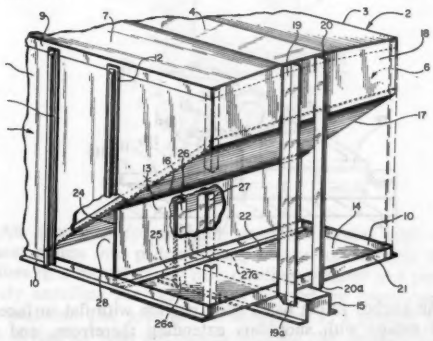


In a center sill-less railroad hopper car, a pair of opposed end structures and a central hopper portion having opposed slope sheets, each end portion comprising a stub center sill on which is mounted a flat horizontal shear plate attached to lateral vertical side skirt means and a bolster web beam mounted on the shear plate and connecting with the side skirt means for beaming the impact loads on the center sill into the side girders of the car, the bolster web beam being attached with the respective slope sheet of the center portion by gusset means mounted on the respective stub sill or an end beam being mounted on the outer end of the shear plate beam and connecting with the sides of the car.

3,605,635
COVERED HOPPER CAR END CONSTRUCTION

Marvin Stark, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

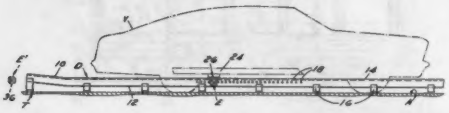
Filed Dec. 30, 1968, Ser. No. 787,943
Int. Cl. B61d *5/00, 7/00, 17/06*
U.S. Cl. 105—248 11 Claims



A hopper railroad car end construction comprising an end stub center sill spaced away from and outwardly of the hopper slope sheet, a car upper end beam attached

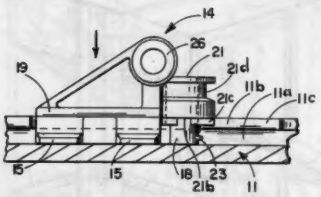
to the slope sheet and to the end of the roof, a horizontal shear plate beam mounted on the stub sill, a transversely extending upright bolster web beam mounted on the shear plate and joining with the slope sheet, an upright end pitching structure connecting the roof upper end beam with the outer end of the shear plate beam and the outer end of the stub center sill, and an upright inner bolster pitching structure on the bolster web beam and attached to the stub sill and connecting the inner end of the shear plate beam and the upright bolster web plate beam with the sides of the car.

3,605,636
TIE-DOWN SYSTEM FOR VEHICLES
Donald J. Blunden, Southfield, Israel D. Peisner, Huntington Woods, and William R. Baker, Detroit, Mich., assignors to Whitehead & Kales Company, River Rouge, Mich.
Continuation of application Ser. No. 720,914, Apr. 12, 1968. This application Apr. 29, 1970, Ser. No. 33,070
Int. Cl. B60p *7/08;* **B61d** *45/00*
U.S. Cl. 105—368T **14 Claims**



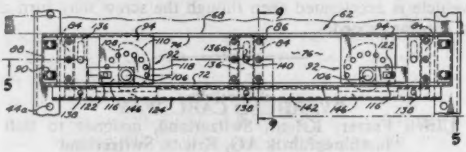
This invention relates to a tie-down system for vehicles. In the specific embodiment disclosed, a transverse beam is mounted on each vehicle, and laterally spaced rails on a transport are adapted to engage rollers on the ends of the beam to automatically depress the vehicle as it is moved onto the transport between the rails. Any suitable means may be provided to lock the vehicle while in depressed position, and preferably for this purpose locking pins are carried by the beam and are engageable in selected keeper openings in the rails. The beam in the disclosed embodiment is free to slide transversely of the vehicle, and guide rollers on the beam guide it between the rails.

3,605,637
ANCHOR FITTING FOR SECURING LOADS TO A RETAINER TRACK
Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.
Filed Sept. 2, 1970, Ser. No. 68,942
Int. Cl. B61d *45/00;* **B60p** *7/08*
U.S. Cl. 105—369A **12 Claims**



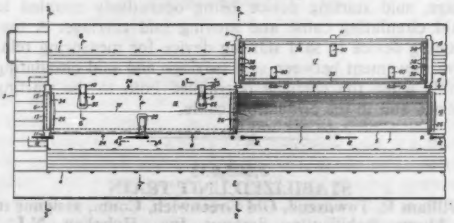
An anchor fitting has a body portion with flat surfaced pad means with shoulders extending therefrom, and a post portion extending along an axis substantially normal to the flat surfaces of the pad means. A latching plunger member is slidably mounted on the post portion for motion along the longitudinal axis thereof. The anchor fitting is removably retained in a selected position along a slotted track having a plurality of notched portions separated by narrow neck portions; with the shoulders of the pad means in the track slots underneath the neck portions and with the latching plunger member seated in one of the notched portions thereof.

3,605,638
EXPANDABLE LOAD BRACE
Robert E. James, Parma Heights, Ohio, assignor to The Shunk Manufacturing Company, Inc., Bucyrus, Ohio
Filed Jan. 10, 1969, Ser. No. 790,233
Int. Cl. B60p *7/16;* **B61d** *45/00*
U.S. Cl. 105—369B **8 Claims**



An elongated load brace has a fixed portion adjustably positioned at selected fixed points along spaced, parallel rails. A movable portion is cammed laterally away from the fixed portion against the load and then locked in place. Cam means for moving the movable portion are mounted on axes disposed perpendicular to the plane of lateral movement of said movable portion.

3,605,639
FIBER GLASS HATCH COVER
Orville Ingram, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed July 23, 1968, Ser. No. 746,787
Int. Cl. B61d *39/00*
U.S. Cl. 105—377 **9 Claims**

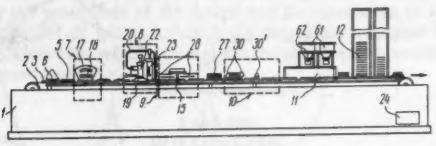


A molded fiber glass cover for roof hatches of covered railway hopper cars, the hatch cover being of a hollow, internally integral truss-reinforced construction combining great strength and durability with very light weight.

3,605,640
INSTALLATION FOR MAKING MULTILAYER CAKES
Oleg Grigorievich Lunin, Zeleny prospekt 10/32, korpus 27, kv. 17, Moscow, U.S.S.R.
Filed June 26, 1969, Ser. No. 836,902
Int. Cl. A23g *3/00*
U.S. Cl. 107—1 **5 Claims**

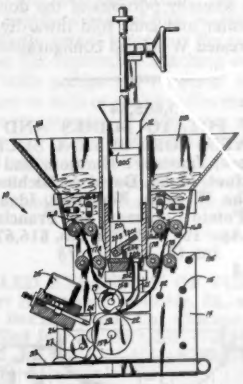
An installation for making multi-layer cakes comprises a plurality of mechanisms mounted in succession in

the direction of the technological process for treating a cake block displaced by a periodically-actuated conveyor. One mechanism serves for distributing on the side faces of the multi-layer cake the pastry mass laid on the face of each cake block, and this mechanism is located before a mechanism for covering the side faces of the multi-layer cake with crumbs. To cover the face of each



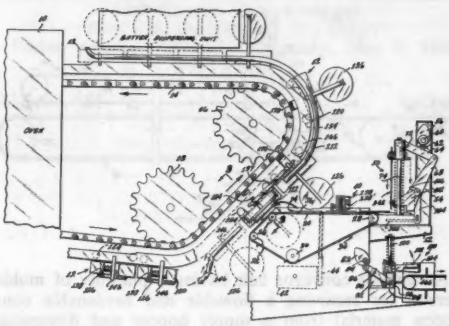
cake block with pastry mass, the slit of a slit-shaped nozzle of a mechanism for covering the cake block with pastry mass has a length exceeding the transverse dimensions of the cake block, and the feeding of the pastry mass through the slit of the nozzle is started before the nozzle reaches the cake block and is discontinued after the nozzle has passed above the cake block.

3,605,641
RAVIOLI MAKING MACHINE
Philip Shuster, Monsey, N.Y., assignor to Power Mount Corporation, Passaic, N.J.
Filed July 22, 1969, Ser. No. 843,329
Int. Cl. A21c *11/08*
U.S. Cl. 107—1A **4 Claims**



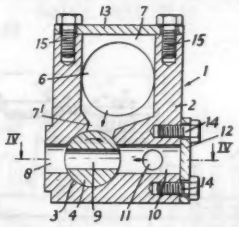
This disclosure is directed to a machine for producing ravioli featuring readily interchangeable assembly of guide tubes through which the fill material is dispensed to form consecutive rows of ravioli, an adjustable stroke metering pump for controlling the amount of the individual portions of fill material, means for interchanging various crimping dies and for adjusting the stroke frequency of the pump in relation to particular crimping dies for enclosing such portions of fill material between two moving dough sheets for producing various sizes of ravioli. For each size or shape of crimping die adapted to be interchangeably used on the machine, the stroke of the metering pump is rendered readily adjustable to synchronize the frequency thereof to a given size crimping die.

3,605,642
FORTUNE COOKIE MACHINE
Robert E. Brown, Pasadena, Calif., assignor to Sam Ward Company, Inc., Los Angeles, Calif.
Filed Nov. 27, 1968, Ser. No. 779,384
Int. Cl. A21b *5/00;* **A21c** *9/00*
U.S. Cl. 107—4A **10 Claims**



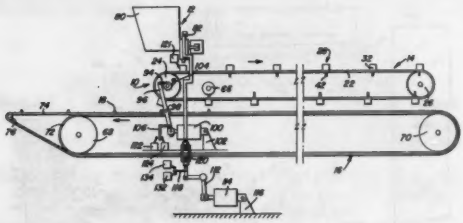
The invention is a fortune cookie making machine. The batter is cooked in cooking units that are carried through an oven on a conveyor. The cooked batter units are ejected from the cooking unit and conveyed to a unit which places a fortune cookie slip on them and then to a folding unit which folds the fortune cookie about the fortune cookie slip. The folded fortune cookie is removed from the folding unit by a take-away unit which places it on a final conveyor.

3,605,643
APPARATUS FOR THE TREATMENT OF PASTY SUBSTANCES
Peter Joachim Barr, London, England, assignor to Barr & Murphy Limited, London, England
Filed Feb. 3, 1970, Ser. No. 8,265
Claims priority, application Great Britain, Feb. 20, 1969, 9,342/69
Int. Cl. A21c *5/00;* **B29c** *7/00*
U.S. Cl. 107—8DA **4 Claims**



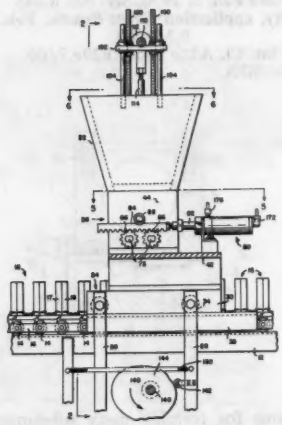
An apparatus for forming pasty substances such as wheat gluten into pellets having means for forming the pellets in a mould cavity in a rotating member and positively expelling the pellets thus formed by compressed air pressure. The apparatus is employed in a process for the drying of such substances wherein the substance in the form of pellets is introduced into a stream of heated air circulating in a closed path and is subjected to disintegration action whilst suspended in the air stream.

3,605,644
CHOCOLATE DROP MAKING MACHINE
Charles C. Cartia and William H. Shaw, Elizabeth, Pa., assignors to Thurman's Inc.
Filed Feb. 18, 1969, Ser. No. 800,132
Int. Cl. A23g 1/22
U.S. Cl. 107—8 2 Claims



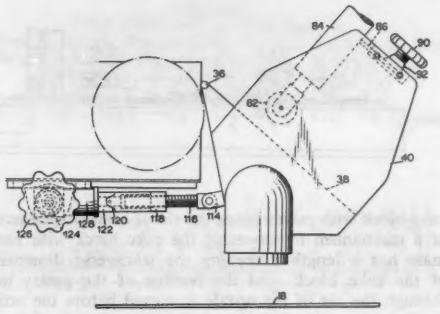
An endless conveyor belt having a plurality of molds thereon for receiving a flowable and hardenable confection material from a supply hopper and dispensing mechanism with each mold having an ejector pin inserted into the bottom of the mold by an actuator for ejecting the hardened confection from the mold onto a conveyor for carrying the hardened confections to another station for coating with chocolate or the like.

3,605,645
LIQUID MOLDING MACHINE
Heinz A. Herrmann, Pennsburg, Pa., assignor to Shelly Bros., Inc., Lansdale, Pa.
Filed Oct. 30, 1969, Ser. No. 872,614
Int. Cl. A23g 3/20; B67c 3/20
U.S. Cl. 107—8 10 Claims



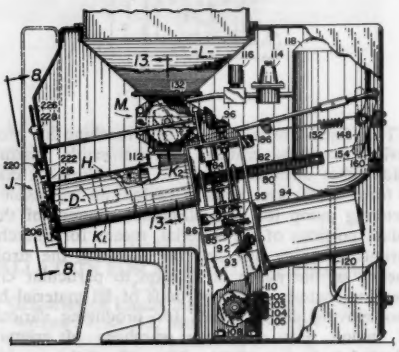
A machine for dispensing hot candy syrup into molds carried by a conveyor involving a valve means for controlling the flow of a measured amount of syrup from a supply bucket to a dispensing chamber from which it is dispensed into the conveyor molds.

3,605,646
DOUGH MANIPULATION
John Jolly, Nelson, near Burnley, and Neil Clyde, Pike Hill, Burnley, England, assignors to Tweedy of Burnley Limited, Burnley, England
Filed Feb. 3, 1969, Ser. No. 795,937
Int. Cl. A21c 11/00
U.S. Cl. 107—9 13 Claims



Apparatus for folding an elongated cylindrically dough shaped mass into a sinuous formation comprising means for peripherally scoring the mass at periodic intervals at its length, a conveyor for carrying the dough mass beneath the scoring means to a conveyor discharge end for cross-panning the dough comprising a sloping, fluidised bed over which the dough mass passes in lengthwise fashion, and dough mass retarding means comprising a rotatable wheel having a fluidised surface for slowing movement of the dough mass at its center and fluidised end wall surfaces arranged to retard movement of the mass at its ends whereby portions of the dough mass intermediate its center and ends fold inwardly to produce a mass of compressed W-shaped configuration.

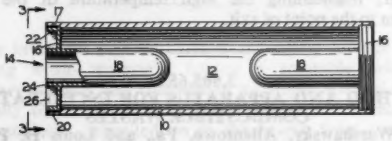
3,605,647
FRENCH FRY POTATO BODIES AND METHOD AND APPARATUS FOR FORMING SUCH BODIES
Roderick G. Beck, James F. Harmon, and Mounir A. Shatila, Blackfoot, Idaho, David A. Richins, Bountiful, Utah, and John H. Lach, Blackfoot, Idaho, assignors to American Potato Company, San Francisco, Calif.
Filed Apr. 16, 1969, Ser. No. 816,675
Int. Cl. A21c 11/18
U.S. Cl. 107—14 15 Claims



A machine for forming from potato dough elongate bodies that resembled potato pieces suitable for french frying. The machine is arranged to move the dough

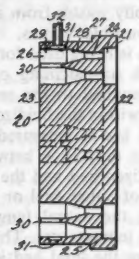
through spaces between a set of parallel wires, which wires are spaced from one another by amount corresponding to the width of the piece. The length of the spaces determines the length of the potato piece. A second set of parallel wires is supported in registry with the first mentioned set during dough movement; after the dough is moved by an amount corresponding to the thickness of a french fry body, the wires of the second set are moved across the dough to separate potato pieces suitable for french frying. A machine for automatically synchronizing the movement of the dough and the movement of the second set of wires. A french fry potato piece formed by the apparatus which piece is characterized by an uncompressed surface.

3,605,648
ROLLING PIN
Robert F. Petix, 1449 SE. Birch, Beaverton, Oreg. 97005; Joseph A. Aquino, 10856 Wolcott Place, Mission Hills, Calif. 94901; and Frank J. Aquino, 6078 Dovetail Drive, Agoura, Calif. 91301
Filed Mar. 6, 1969, Ser. No. 804,824
Int. Cl. A47j *43/00*
U.S. Cl. 107—50 **1 Claim**



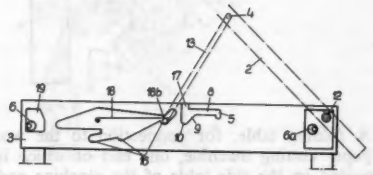
A rolling pin has a body portion of tubuar construction forming a compartment therein. The rolling pin includes end handle members each having a disc-like base portion and a projecting gripping portion. The base portion of the handle members has exterior screw threads engageable with interior screws threads at the ends of the tubular body portion for removably attaching said handle members to the body portion. By means of such threaded engagement, one or both of such handles may be temporarily removed for the purpose of placing ice cubes or water in the body portion of the rolling pin. The handle members are adapted to be inverted so that the gripping portions thereof can be turned inwardly to project into the body portion of the rolling pin for compactness in storage.

3,605,649
CONTROLLED EXPANSION OF PUFFED SNACKS
Robert H. Bundus, Riverside, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed July 22, 1969, Ser. No. 843,662
Int. Cl. A23l *1/18*; B29f *3/00*
U.S. Cl. 107—54 **4 Claims**



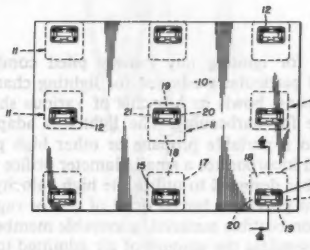
Uniformly expanded extrudant is obtained by passing the extrudant of extruder through a shaping portion, an expanding portion and a stabilizing portion of a bore in a die plate. Shaping with no expansion takes place in the shaping portion, a gradual expansion takes place in the tapered expanding portion and no expansion takes place in the stabilizing portion.

3,605,650
DRAFTING TABLE
Walter Hebel and Ulrich Hebel, both of 4 Bruckenstrasse, 5242 Kirchen (Sieg), Germany
Filed Feb. 19, 1969, Ser. No. 800,577
Claims priority, application Germany, May 9, 1968, P 17 78 532.9
Int. Cl. A47f *5/12*
U.S. Cl. 108—9 **9 Claims**



This invention has to do with a drafting table and, more particularly, to such a table having a top that may be used horizontally and which can be readily changed to an inclined position.

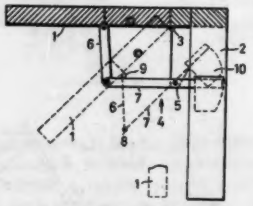
3,605,651
PALLET OF LOW-COST DISPOSABLE TYPE
Charles T. Stewart, P.O. Box 2486, Zanesville, Ohio 43701
Filed May 28, 1969, Ser. No. 828,564
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **8 Claims**



A low-cost disposable type pallet including a load-supporting deck panel of inexpensive material having a plurality of sockets in which are locked separately-produced, inexpensive, hollow, molded legs which project

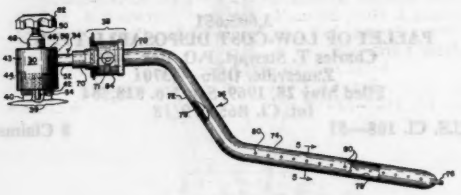
below the panel and support it and which are properly distributed throughout its area to provide spaces for receiving the tines of a fork-lift truck.

3,605,652
FOLDING TABLE FOR CONNECTION TO THE WORKTABLE OF PAPER CUTTING MACHINES
Rudolf Mohr, Hattersheimerstrasse, 6238 Hofheim, Taunus, Germany
Filed Mar. 25, 1969, Ser. No. 810,109
Claims priority, application Germany, Mar. 30, 1968, P 17 61 075.2
Int. Cl. A47b *5/00*
U.S. Cl. 108—152 4 Claims



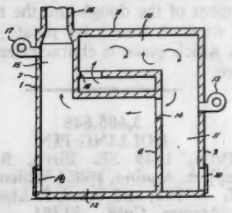
A folding table, for connection to the worktable of a paper cutting machine, one end of which is pivotally mounted on the side table of the machine and in which the movement of the folding table from the in-service position to the out-of-service position, and vice versa, takes place by means of an articulated lever linkage.

3,605,653
GAS-FIRED CHARCOAL LIGHTER AND METHOD OF CHARCOAL IGNITION
Fred Donnell, 332 Maplewood, Bridgman, Mich. 49106
Filed Nov. 14, 1969, Ser. No. 876,970
Int. Cl. F23b *1/02*
U.S. Cl. 110—1F 7 Claims



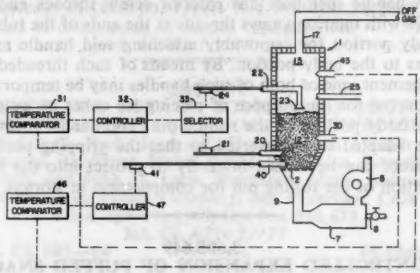
A lighter for igniting any loosely piled combustible material and particularly adapted for lighting charcoal in any of the pans, bowls or hibachis of various shapes in common use for barbecuing. The lighter is adapted for connection to a portable propane or other high pressure fuel tank and incorporates a small diameter orifice feeding into a chamber designed to utilize the high velocity gas as a jet pump to provide a forced draft of air for rapid ignition of the combustible material, a movable member being provided to regulate the amount of air admitted to the jet pump and a conduit member being provided to conduct the gas and air to a burner member submerged in the loosely piled charcoal or other combustible material. In use, the lighter affords a novel method of ignition wherein the lighter functions as a forge to aerate the partially ignited pieces of charcoal.

3,605,654
THERMAL DUCT RECIRCULATING INCINERATOR
Henry L. Bowles, Jr., 4106 Center St., Houston, Tex. 77007
Filed May 4, 1970, Ser. No. 34,276
Int. Cl. F23g *5/12*
U.S. Cl. 110—8A 5 Claims



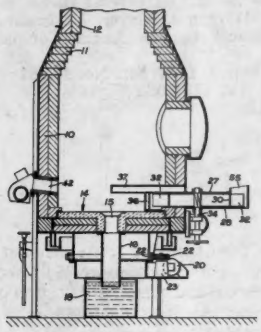
An incinerator for destroying waste material having a recirculating duct that maintains a high temperature causing fly ash spin out and complete oxidation of residual matter, maintaining the high temperature of the flue stream to the point of exit.

3,605,655
METHOD AND APPAPATUS FOR INCINERATING COMBUSTIBLE WASTES
Jay Warshawsky, Allentown, Pa., and Louis H. Piper, Tucson, Ariz., assignors to Fuller Company
Filed May 5, 1970, Ser. No. 34,829
Int. Cl. F23g *5/08*
U.S. Cl. 110—8R 12 Claims



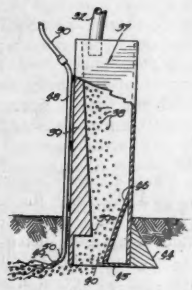
A control system for a fluidized bed reactor which is used for treating material. Although the control system is primarily designed for use with a reactor which is used for incinerating combustible wastes such as sewage sludge, oily wastes such as oily wastes from an oil refining operation or other combustible wastes, it may also be used with a reactor which is being used for other high temperature operations such as calcining operations. Fuel and quench water are supplied to the reactor to maintain a desired temperature within the fluidized bed. The temperature of the fluidized bed is measured and compared to a set temperature. The difference between the actual temperature of the fluidized bed and the desired temperature controls the supply of either fuel or quench water to the reactor to maintain the actual temperature of the bed equal to the desired temperature. The temperature of the freeboard area above the fluid bed is also measured and compared with a desired temperature. A controller responsive to the difference between the desired temperature of the freeboard area and the actual temperature controls the volume of wastes supplied to the reactor.

3,605,656
FURNACES
John Brian Stribling, Sutton Coldfield, England, assignor to Calval Developments Limited, Wednesbury, England
Filed May 22, 1969, Ser. No. 826,863
Claims priority, application Great Britain, June 8, 1968, 27,361/68
Int. Cl. F23g 5/00
U.S. Cl. 110—13 10 Claims



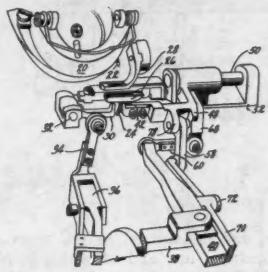
The invention provides a fully automatic furnace for burning waste materials, having a rotatable hearth, auxiliary burners and combustion air inlets directed tangentially on to the hearth, and a plough for deflecting waste material deposited on to the hearth from one to another of the concentric paths so that the residue after combustion is directed into an axial ash chute.

3,605,657
METHOD AND APPARATUS FOR APPLYING DRY FERTILIZER AND ANHYDROUS AMMONIA IN A COMMON BAND
Leonard M. Brannan, 3008 Paddock Road, Apt. 211C, Omaha, Nebr. 68124
Filed Apr. 7, 1969, Ser. No. 813,968
Int. Cl. A01c 23/02
U.S. Cl. 111—7 6 Claims



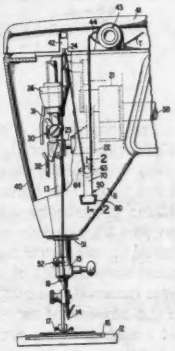
Method and apparatus is disclosed for chemically combining a dry fertilizer and anhydrous ammonia in a band at a predetermined depth beneath the soil surface. A plowing knife is introduced into the soil and pulled by a surface traction vehicle to form a channel of predetermined depth. A band of dry fertilizer is deposited in the bottom of the channel by the plow via a conduit extending longitudinally of the knife; and anhydrous ammonia contacts the deposited dry fertilizer at a location behind the deposited dry fertilizer. The anhydrous ammonia is carried by means of a closed conduit attached to the rear of the knife and slight rearwardly inclined at its lower end so that the point of application of ammonia to the band is at a location rearward of the shank. Attached to one side of the plow knife is an inverted moldboard for gathering soil from the side of the knife and routing it behind the knife over the point of application of ammonia rearward of the knife to cover the ammonia and prevent its escape in gaseous form into the atmosphere. A second inverted packing moldboard is attached to the other side of the knife for gathering soil and routing it behind the knife and packing it down above the point of application of the ammonia.

3,605,658
SEWING MACHINES
Joseph R. Ioannilli, Beverly, Mass., assignor to USM Corporation, Boston, Mass.
Filed July 8, 1970, Ser. No. 53,173
Int. Cl. D05b 15/00
U.S. Cl. 112—54 11 Claims



A sewing machine for uniting by a seam work pieces of unequal lengths by puckering the longer work piece so that its length matches that of the shorter as the insertion of the seam progresses. The puckering, which is particularly useful in sewing a moccasin vamp to a moccasin plug, is accomplished by a mechanism including a puckering awl which engages the longer of the two parts, typically the vamp, ahead of a sewing plane. The awl is advanced in a straight line toward the sewing plane to a greater extent than the plug thereby causing the vamp to pucker.

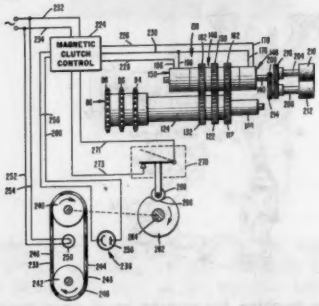
3,605,659
THREAD GUIDE FOR SEWING MACHINES
Stephen J. Illes, Summit, N.J., and Salvatore A. D'Orio, Staten Island, N.Y., assignors to The Singer Company, New York, N.Y.
Filed July 16, 1970, Ser. No. 55,329
Int. Cl. D05b 1/00, 3/02, 49/00
U.S. Cl. 112—154 6 Claims



A thread guide for directing thread to the take-up of a sewing machine with a needle bar interrupting mechanism for enabling the sewing machine to skip stitches. The thread guide is constructed and arranged with thread

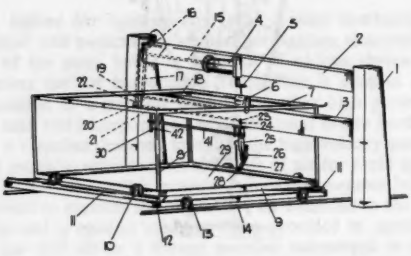
retaining means to prevent the surplus thread occasioned by operation of the skip-stitch mechanism from disengaging the thread guide or from becoming snarled or entangled therewith.

3,605,660
YARN FEEDING MECHANISM FOR A PILE LOOP-FORMING MACHINE
Joe T. Short, West Point, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed May 13, 1969, Ser. No. 824,054
Int. Cl. D05c *15/32*
U.S. Cl. 112—79A **24 Claims**



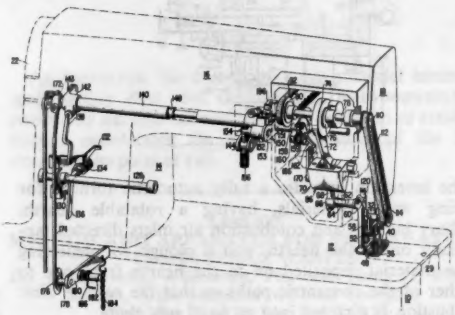
A yarn feeding mechanism for a pile loop-forming machine comprising a central drive unit and a plurality of yarn feed modules positioned about the drive unit, each of the modules including a yarn feed drive shaft, a plurality of selectively engageable clutches mounted on the drive shaft and drivably connected to the drive unit for selectively rotating the shaft at different rotational velocities, and yarn feed means drivably connected to the drive shaft and operable to feed different lengths of yarn depending upon which of the clutches rotates the drive shaft.

3,605,661
GUIDE TRACK MEANS FOR QUILTING MACHINES
John Cooper, West Bridgford, England, assignor to J. C. Attachments Limited, Nottingham, England
Filed Feb. 19, 1969, Ser. No. 800,480
Claims priority, application Great Britain, Feb. 20, 1968, 8,094/68
Int. Cl. D05b *11/00, 35/00*
U.S. Cl. 112—118 **1 Claim**



A machine for forming a preformed pattern on a substantially flat object, as for example, a sewing pattern on a mattress or the like, said machine having a novel guide track means for a follower including a groove formed in a substantially flat member and a corrugated strip located at the bottom of said groove.

3,605,662
UPPER FEED MECHANISM
Erich M. Willenbacher and Karl-Heinz Michel, Karlsruhe-Hagsfeld, and Werner J. Mayer, Karlsruhe-Durlach, Germany, assignors to The Singer Company, New York, N.Y.
Filed May 1, 1970, Ser. No. 33,751
Int. Cl. D05b *27/04*
U.S. Cl. 112—212 **19 Claims**

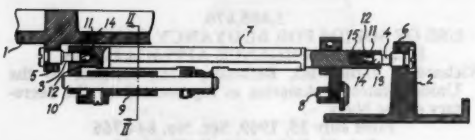


A sewing machine having an upper feed mechanism adapted to be used independent of or in conjunction with a conventional lower feed. The upper feed dog is given advance and return movement through a quadratic linkage which is rocked by a pair of rocker arms driven through a regulating member from an eccentrically oscillated pitman. A timing belt transmits motion from the shaft to a shaft on which the pitman eccentric is mounted. This latter shaft also mounts a second timing belt which drives a second eccentric to give lift and dropping movement to the upper feed dog. The regulating member may be adjusted to change the upper feed either simultaneously or independently of the lower feed mechanism by either of two regulating screws operating through a plurality of cranks and couples mounted on a pair of concentric shafts. A foot pedal operated linkage turns the inner of the two shafts, independently of the two regulating screws, to effect a quick change of the upper feed only for as long as the pedal is depressed, returning the upper feed to its present amount upon release thereof. An indicator scale and pointer show the difference in feeds between bottom and top feed dogs as set by the regulating screw that changes the upper feed only.

3,605,663
BEARING ARRANGEMENT FOR A FEED BAR OF A SEWING MACHINE
Sven Theodor Roberg, Huskvarna, Sweden, assignor to Husqvarna Vapenfabriks Aktiebolag, Huskvarna, Sweden
Filed Mar. 7, 1969, Ser. No. 805,186
Claims priority, application Sweden, Mar. 8, 1968, 3,077/68
Int. Cl. B65h *54/18*
U.S. Cl. 112—218 **6 Claims**

A bearing arrangement for the feed bar of a sewing machine including frame means, the feed bar having op-

posite ends each having an axial bore having a bottom and a cylindrical wall surface, there being a journal spindle within each bore, supported by the frame means, having an end surface and a geometrical envelope surface applied against the cylindrical wall surface of the



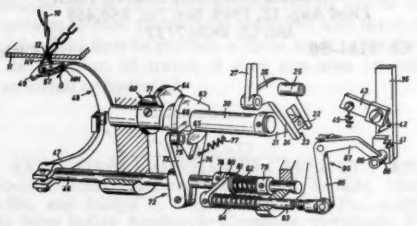
associated bore and a spherical body is interposed between the bottom of each bore and the end surface of the associated spindle; if desired, a helical spring can be interposed between the bottom of one bore and the associated spherical body.

3,605,664

THREAD CUTTING MECHANISM FOR LOCKSTITCH SEWING MACHINES WITH OSCILLATING LOOPTAKER

Kristen Hedegaard, Gentofte, Denmark, assignor to G. M. Pfaff AG., Kaiserslautern am Pfalz, Germany

Filed Sept. 24, 1969, Ser. No. 860,706
Claims priority, application Germany, May 13, 1969, P 19 24 281.0
Int. Cl. D05b 65/02
U.S. Cl. 112—252 8 Claims



Thread cutting mechanism for a lockstitch sewing machine with oscillating looptaker comprises a curved thread catcher carrying a flat cutting knife and being mounted for oscillating movement in the direction of movement of the looptaker. The thread catcher is operated by an auxiliary shaft parallel to and operably connected with the looptaker rockshaft via a multiple motion-transmitting cam mechanism designed to effect a two-step thread catching and cutting operation during a looptaker oscillating cycle by first operating the thread catcher axially to a favorable position for separating the bobbin thread and the work limb of the needle thread loop and subsequent cutting of the separated threads by the cutting knife.

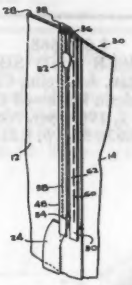
3,605,665

INSTALLATION OF SLIDE FASTENERS

Florence O. Donald, 7333 New Hampshire Ave., Apt. 517, Hyattsville, Md. 20783

Filed Sept. 29, 1969, Ser. No. 861,919
Int. Cl. D05b 97/10
U.S. Cl. 112—265 3 Claims

A slide fastener is installed by a process wherein meeting fabric panels are temporarily basted to one another and the seam allowances slit to mark the fastener location. Thereafter the seam allowances are doubled at such



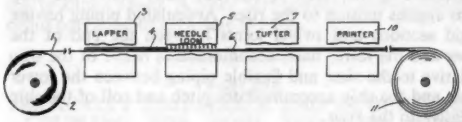
locations, and the fastener tapes are affixed to the doubled seam allowances. The temporary basting is then removed.

3,605,666

TUFTED CARPET WITH COMPATIBLY DYABLE NEEDLEBONDED SUBFACE AND METHOD OF MANUFACTURING SAME

Richard Kimmel, Libertyville, and Robert G. Rowan, Arlington Heights, Ill., and Arthur R. Hild, Tustin, Calif., assignors to Ozite Corporation, Libertyville, Ill.

Filed June 13, 1969, Ser. No. 833,087
Int. Cl. D05c 17/02
U.S. Cl. 112—410 2 Claims



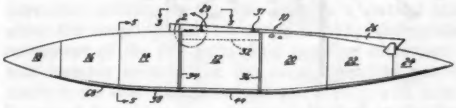
A patterned tufted carpet includes a thin needlebonded subface which visually masks the scrim and the bases of the tufts, and the tufts and subface fibers are equally, compatibly dyable so that the coloration and light reflectance are uniform. The carpet is made by needling the subface onto the scrim, tufting through the scrim and subface, and then dying or printing.

3,605,667

AIRCRAFT FUEL TANK AND METHOD OF MAKING SAME

Ronald Wilks, Berwyn, and Emil C. Wojcik, Brookhaven, Pa., assignors to Day & Zimmermann, Inc., Philadelphia, Pa.

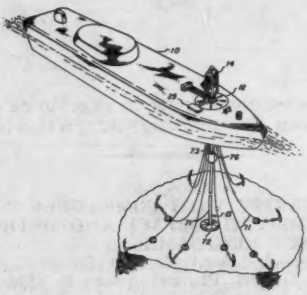
Filed Oct. 21, 1968, Ser. No. 769,244
Int. Cl. B21d 51/00
U.S. Cl. 113—120R 3 Claims



An aircraft fuel tank is provided which need not be jettisoned when flying over Mach I and which is aerodynamically stable. Tank sections are conical spun sections except for the center cylindrical section containing

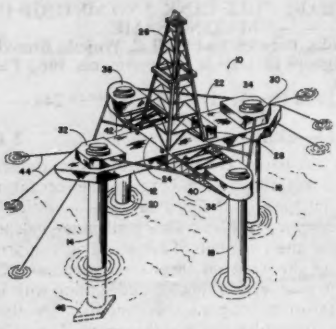
all of the plumbing. Each spun section has an integral reinforcement frame at one end. Unassembled tanks can be stacked and assembly time in the field is substantially less than ninety man minutes.

3,605,668
UNDERWATER RISER AND SHIP CONNECTION
George W. Morgan, Anaheim, Calif., assignor to North American Rockwell Corporation
Filed July 2, 1969, Ser. No. 838,489
Int. Cl. B63b *35/00*; E21b *43/01*
U.S. Cl. 114—.5 14 Claims



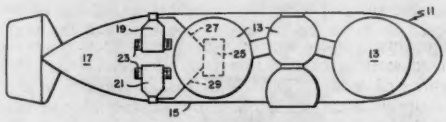
A connection between a relatively rigid underwater riser and the deck of a ship is described. A tiltable tower on the ship accommodates ship motion while maintaining a tension in the riser. A buoyant body below the ship also applies tension to the riser. Articulated piping having rigid sections and swivel joints between the end of the riser and the lower base, accommodates heave of the ship relative to the riser and flexible piping between the tower base and the ship accommodates pitch and roll of the ship relative to the riser.

3,605,669
FLOATING SELF-ELEVATING PLATFORM
Tsi V. Yu, Oklahoma City, Okla., assignor to Kerr-McGee Corporation
Substituted for abandoned application Ser. No. 678,878, Oct. 31, 1967. This application Dec. 1, 1969, Ser. No. 881,315
Int. Cl. B63b *35/00, 35/44*
U.S. Cl. 114—.5 9 Claims



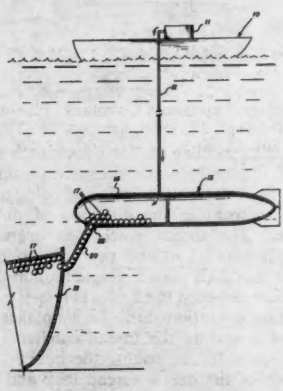
A floating vessel for marine operations such as well drilling in deep offshore waters. Buoyancy and stability in the operating position are provided by a plurality of elongated columns located in a stabilizing pattern about the vessel, and a barge or ship supporting a working platform vertically movable relative to the columns is provided. The barge supporting the working platform provides additional buoyancy and stability during relocation of the vessel.

3,605,670
USE OF SOLIDS FOR BUOYANCY CONTROL IN DEEP SUBMERGENCE APPLICATIONS
Richard J. Dzikowski, Bethesda, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed July 25, 1969, Ser. No. 844,766
Int. Cl. B63g *8/00*; B63b *21/52*
U.S. Cl. 114—16 8 Claims



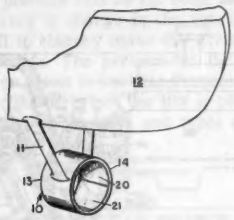
A low energy buoyancy control system for a deep submersible vehicle employing a plurality of discrete buoyant bodies in a non-pressurized, ambient water-containing tank, with means for controllably releasing the buoyant bodies to decrease buoyancy of the vehicle.

3,605,671
APPARATUS FOR SALVAGING SUBMERGED VESSELS AND OTHER OBJECTS
Jim D. Helbig, Brighton, Colo., assignor to Cyclo Manufacturing Company, Denver, Colo.
Filed Aug. 15, 1969, Ser. No. 850,469
Int. Cl. B63c *7/12*
U.S. Cl. 114—50 3 Claims



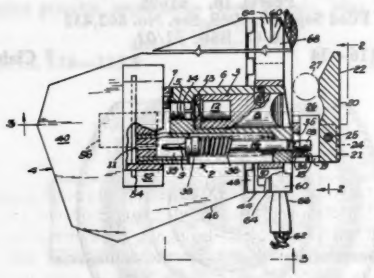
Apparatus for salvaging sunken vessels and other objects comprising pressurized buoyant elements conveyed to the submerged vessel or object through a conduit having an internal diameter less than twice the diameter of any of the buoyant elements. When employed in deep waters, the apparatus includes a submarine boat provided with means for pressurizing buoyant elements therein, and a conduit shorter than the distance between the surface of the water and the submerged vessel conveying the pressurized buoyant elements from the submarine boat to the submerged vessel.

3,605,672
DIRECTIONAL CONTROL APPARATUS
William P. Strumbos, 85 Middleville Road, Northport, N.Y. 11768
Filed Dec. 2, 1968, Ser. No. 781,303
Int. Cl. B63h 5/14, 25/06
U.S. Cl. 114—166 50 Claims



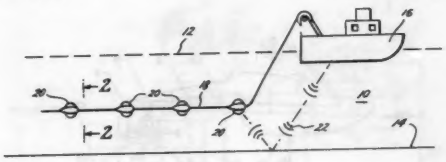
Directional control apparatus having a stationary open-centered steering or direction controller which uses the dynamics of a fluid flow over extensible portions of the controller wall rather than a bodily displacement of the controller itself to produce steering forces in a fluid medium. The controller comprises an open-ended structure having either an open or closed periphery and inflatable sector means associated with the controller walls to vary the configuration thereof. Means are provided to inflate the sectors in predetermined portions of the wall selectively to vary the configuration of the controller, thus changing the characteristics of the fluid flow thereover such that a force that can be used for directional control is produced. Inasmuch as this force can be produced in any quadrant of the open-centered controller, control of the vehicle can be effected in pitch and roll, as well as yaw. If an annular shaped controller is used, it can be employed as the duct for a ducted fan or ducted screw propulsion system. Because the controller uses the dynamics of a fluid flow to produce a force on it perpendicular to its direction of travel, it thus can also be utilized as an airfoil or hydrofoil.

3,605,673
EXPLOSIVELY OPERATED CABLE CUTTER
Robert Temple, Pittsburgh, Ernest E. Temple, Murrysville, and Joseph L. Giebel, Pittsburgh, Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Sept. 30, 1968, Ser. No. 763,790
Int. Cl. B63g 7/04, 7/00, 13/00
U.S. Cl. 114—221 17 Claims



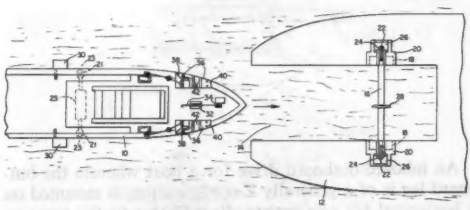
An expendable cable cutter which is explosively fired to cut cable. A trigger mechanism is actuated by the cable and comprises a key-hole slot for retaining and releasing a hydraulic firing mechanism to propel the chisel to sever the cable. The cutter is mounted on a stabilizing fin by a releasable connection which releases the cutter from the fin in response to the recoil of the cutter frame when the cutter is fired. The fin comprises a hinged or sliding clamping device for receiving the sweep line and clamping the fin to the line.

3,605,674
UNDERWATER CABLE CONTROLLER
Raymond C. Weese, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sept. 8, 1969, Ser. No. 855,939
Int. Cl. B63b 21/00
U.S. Cl. 114—235B 9 Claims



The present invention is directed to controllers for use in connection with cables that are towed beneath a body of water in order to maintain the cable in a desired position. The controller employs control planes or vanes vertically disposed on opposite sides of the controller for maintaining position in a horizontal plane, and vanes horizontally disposed on opposite sides to maintain position in a vertical plane. Standard reversible D.C. motors or D.C. torque motors are used to control the position of the vanes in response to signals transmitted from the towing or other vessel. A yoke arrangement allows simultaneous operation of each pair of vanes.

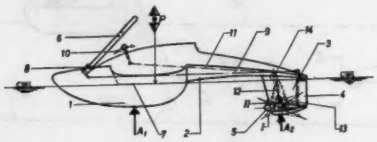
3,605,675
VERTICALLY ADJUSTABLE AND ARTICULATED COUPLING FOR PUSH TUG AND BARGE COMBINATIONS
Elliott I. Clemence, Jr., Devon, Pa., assignor to Interstate Oil Transport Company, Philadelphia, Pa.
Filed Jan. 13, 1970, Ser. No. 2,526
Int. Cl. B63b 21/00
U.S. Cl. 114—235 12 Claims



A push tug-barge coupling means for transmitting thrust from the tug to the barge while permitting independent pitching of the two units in a vertical plane about the coupling and restraining all other independent movement of the two units. Said coupling comprises an axle member mounted on the barge extending across a notch in the rear section thereof and mating with laterally spaced thrust bearing members mounted on the front section of a tug which fits into the notch. The axle is secured to vertically movable members in vertical channels on either side of the notch in the rear section of the barge so that the vertical position of the axle may be adjusted depending on the draft of both the tug and

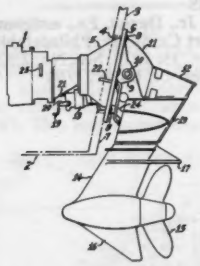
the barge in the water. Retractable rollers are mounted on the side of the tug aft of the tug's thrust bearing members thereby preventing uneven loading on the coupling members by keeping the centerlines of the tug and barge parallel.

3,605,676
MOTORLESS WATER-BORNE VEHICLES
Joachim Spangenberg, Andechsstrasse 6, Gauting, Germany
Filed Jan. 23, 1969, Ser. No. 793,386
Claims priority, application Germany, Jan. 30, 1968, P 15 56 494.0
Int. Cl. B63h *1/30, 19/02*
U.S. Cl. 115—21 **14 Claims**



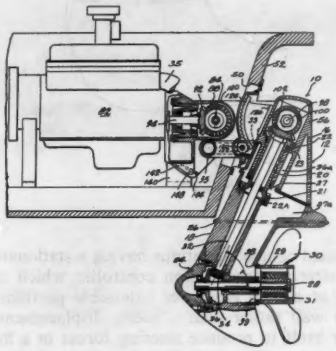
A water-borne amusement craft having a large front float, and a smaller rear float connected by a spar, the rear float carrying a horizontal fin which can flex about a horizontal axis as the craft is rocked to propel the craft by a fish-tail effect. The fin may be pivoted on an axis or may be flexible or the spar may be flexible and two separate spars and rear floats may be used.

3,605,677
BOAT DRIVE ARRANGEMENT
Karl Abdon Bergstedt, Goteborg, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden
Filed Jan. 6, 1970, Ser. No. 907
Int. Cl. B63h *1/14, 5/06*
U.S. Cl. 115—35 **11 Claims**



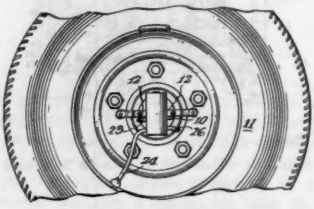
An inboard-outboard drive for a boat wherein the outboard leg is of a generally Z configuration, is mounted on a horizontal tilt axis rearwardly adjacent to the transom and includes a downwardly and forwardly inclined drive shaft coupled at its lower end to a generally horizontal propeller shaft. The connection between the drive shaft and the propeller shaft is through gearing having a ratio equal to substantially the cosine of the angle between the drive shaft and propeller shaft. The lower portion of the outboard housing is arranged to rotate for steering about the axis of the drive shaft. Hydraulic steering means are provided for rotating the lower housing, including a double acting hydraulic cylinder and piston means, the piston means being provided with ports and check valves which open automatically at each extreme of the steering movement to permit a flow of hydraulic fluid through the piston means to scavenge air from the system.

3,605,678
MARINE PROPULSION DEVICE WITH ACUTE ANGLE DRIVE
William J. Shimanckas, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed July 24, 1969, Ser. No. 844,457
Int. Cl. B63h *5/12, 25/42*
U.S. Cl. 115—35 **15 Claims**



Disclosed herein is a marine propulsion device which includes a drive shaft housing having upper and lower housing sections. The upper drive shaft housing is rotatably supported aft of the boat transom by a pair of opposed laterally extending trunnions which are supported on the boat hull and which extend into coaxial apertures in the upper end of the drive shaft housing to provide a horizontal tilt axis. The drive shaft housing includes a drive shaft and a propeller shaft which form an acute angle measured on the aftward side of the drive shaft and the upper side of the axis of the propeller shaft. Means are provided for selectively tilting the drive shaft housing about the horizontal tilt axis relative to a normal operating position with the drive shaft extending downwardly and forwardly and with the propeller shaft being generally horizontal. Steering is afforded by rotating the lower housing section about the drive shaft axis. The interior of the lower housing section is in communication with the interior of the upper housing section to afford underwater discharge of exhaust through a passage in the propeller hub.

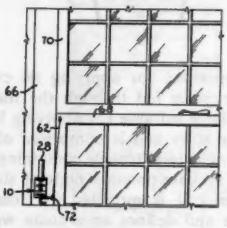
3,605,679
TIRE PRESSURE WARNING DEVICE
George W. Voland, 1035 Gomo Court, Peoria, Ill. 61605
Filed Sept. 30, 1969, Ser. No. 862,432
Int. Cl. B60c *23/02*
U.S. Cl. 116—34 **7 Claims**



A tire pressure warning device which includes an enclosure having a movable wall dividing the interior thereof into first and second chambers. An actuator is operatively connected to the wall for movement in response

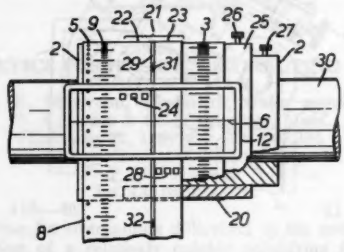
to movement of the wall to actuate the warning device which, preferably, comprises a blank cartridge which is fired. Fluid pressure is admitted to the first chamber at a given pressure corresponding to the desired tire pressure so that the given pressure acts against one side of the movable wall. The second chamber is maintained in fluid communication with the interior of the tire so that the actual tire pressure acts on the other side of the movable wall whereby a change in the actual tire pressure moves the wall to thereby move the actuator to actuate the warning device. The pressure in the first chamber may be varied or preset to equalize the actual tire pressure in the second chamber when the tire is properly inflated to accommodate various sizes and types of tires having various operating pressures.

3,605,680
ANTIBURGLAR DEVICE
Frank E. Bortzfield, L–14 Lake Lotawana, Lee's Summit, Mo. 64063
Filed Jan. 26, 1970, Ser. No. 5,762
Int. Cl. G08b *13/08*
U.S. Cl. 116—87 **5 Claims**



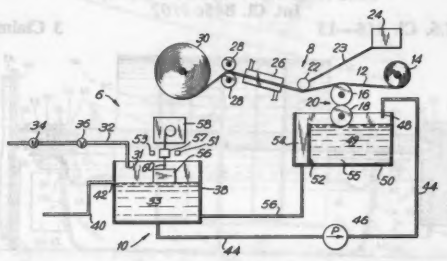
A mechanism for firing a gas cartridge comprising a frame adapted for fixed attachment in the premises to be protected, and a spring actuated firing mechanism. A trigger releasably holds the mechanism in its cocked position until released by either an increase or decrease in tension on a trip element disposed to be manipulated by movement of an intruder about the premises. An alternate embodiment includes a solenoid for releasing the trigger responsive to an intruder initiated change in a circuit supplying energy to the solenoid.

3,605,681
SCALE CONVERSION DEVICE
Beaumont John Davies, Putnoe, Bedford, England, assignor to George Richards & Company Limited, Broadheath, Altrincham, England
Filed May 29, 1969, Ser. No. 828,952
Claims priority, application Great Britain, May 29, 1968, 25,769/68
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 **12 Claims**



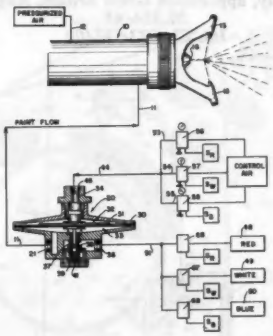
This invention is a device for fitting to machine tools enabling graduations in inches to be converted into graduations on the metric system by use of a belt which runs over the drum carrying the inch graduations as a pulley.

3,605,682
COATING COMPUTER
Raymond Groce, Mamaroneck, Arnold J. Eisenberg, East Setauket, Winton S. Loveland, Fort Salonga, and Saul Warshaw, New York, N.Y., assignors to The Loveshaw Corporation, Farmingdale, N.Y.
Filed June 23, 1969, Ser. No. 835,368
Int. Cl. B05c *11/10*
U.S. Cl. 118—7 **12 Claims**



A coating computer which may be used with apparatus for applying a coating material to a continuous moving substrate to determine the quantity of coating material applied to the substrate per unit area of the substrate. The computer utilizes an intermediate or buffering tank to meter coating material to the coating station and the change in coating material level in the metering tank is determined for a fixed area of substrate by digital read out means to correlate the quantity of coating material applied per unit area of substrate.

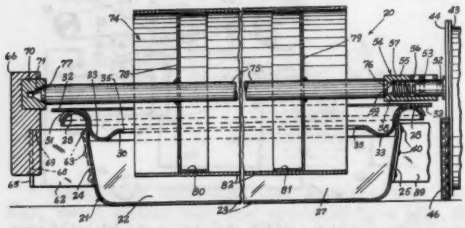
3,605,683
PAINT SPRAY SYSTEM
Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.
Filed Apr. 3, 1969, Ser. No. 813,083
Int. Cl. B05c *5/00, 11/00*
U.S. Cl. 118—8 **4 Claims**



The disclosure relates to a system for delivering a spray coating material, such as paint, to spray guns at any one of several fixed rates controlled by predetermined pressures, which predetermined pressures are selected for optimum coating performance of a specific spray coating material on a specific article. The spray rates of each of the guns at a spray station on a coating line processing a variety of articles with a variety of coatings is controlled by a paint regulator at the gun, which paint

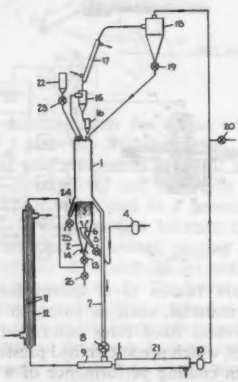
regulator is itself remotely controlled by a selected one of several preset pressure regulators associated therewith. The pressure of each of the remotely located, individual pressure regulators is fixed in advance for optimum performance of the gun with a specific type or color coating material and/or with a specific coating condition determined by the shapes and sizes of the articles.

3,605,684
MOTOR-DRIVEN BUTTER ROLL
William L. McGinley, Dallas, Tex., assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 18, 1969, Ser. No. 850,868
Int. Cl. B05c *1/02*
U.S. Cl. 118—13 **3 Claims**



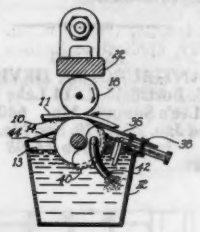
A motor-driven butter roll comprising a pan for containing butter, a drum rotatable through the pan for keeping the roll coated with liquid butter, a motor for rotating the drum, a slip-clutch drive between the motor and the roll, the butter being kept in liquid state by the heat from the motor, the parts being removable for easy cleaning and being separable from the motor to keep the motor free of cleaning liquid.

3,605,685
APPARATUS FOR FLUIDIZING AND COATING A PARTICULATE MATERIAL
DeWitt Henry West, Alexander Bowen Simpson, and Ross Lowndes Simms, Swansea, Wales, assignors to The International Nickel Company, Inc., New York, N.Y.
Original application Aug. 18, 1966, Ser. No. 573,358. Divided and this application Nov. 5, 1969, Ser. No. 871,086
Claims priority, application Great Britain, Aug. 25, 1965, 36,534/65
Int. Cl. C23c *11/02*
U.S. Cl. 118—48 **6 Claims**



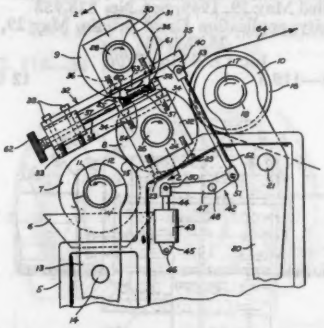
Particulate materials are coated with a metal by decomposing metal carbonyls in a fluidized bed of the particulate materials. A fluid bed reactor with at least one venturi inlet for introducing a fluidizing suspension and a metal carbonyl inlet placed away from the walls of the reactor is employed.

3,605,686
COATING MACHINE
Alton R. Copithorne, Rowley, Mass., assignor to Boston Machine Works Company, Lynn, Mass.
Filed May 26, 1969, Ser. No. 827,572
Int. Cl. B05c *1/02*
U.S. Cl. 118—249 **9 Claims**



A machine is provided for applying an even coating of liquid to a workpiece fed through the machine. The machine is particularly suitable for applying liquid bonding cement to shoe soles and is comprised of a resilient roll drivingly mounted in a trough containing a quantity of the cement. An arcuate pressure plate of slightly larger curvature than the roll is mounted in close proximity to the roll surface and defines an arcuate wedge-shaped gap in which the liquid develops a pressure upon rotation of the roll to thereby control the thickness of the film on the roll and prevent distortion of the roll when a workpiece bears against the roll.

3,605,687
ADJUSTABLE ROLL MOUNTING APPARATUS
Alfred G. Russell, Martinsville, N.J., assignor to Egan Machinery Company, Somerville, N.J.
Filed Oct. 7, 1968, Ser. No. 765,525
Int. Cl. B05c *1/08*
U.S. Cl. 118—262 **6 Claims**



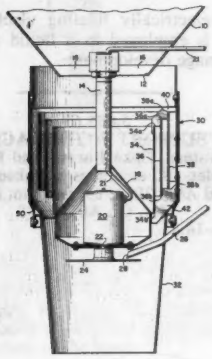
A coating machine having a frame and a pair of rolls that are rotatable about parallel axes and that are spaced

apart to define a gap, one of the rolls being supported at its ends by the machine frame while the other roll is supported at each end by a corresponding beam unit arm that is directly or indirectly anchored at one end to the machine frame. An actuating mechanism is connected to the other end of each arm to effect predetermined bending thereof whereby to adjustably vary and set the size of the gap, as desired.

3,605,688
SEED TREATING MACHINE

Åke E. Hedén, Saltsjo-Boo, and Ulf Ö. Ulfvarson Lidingo, Sweden, assignors to AB Casco, Stockholm, Sweden

Filed Jan. 24, 1969, Ser. No. 793,674
Claims priority, application Sweden, Jan. 26, 1968, 1,042/68
Int. Cl. B05c *5/00*
U.S. Cl. 118—303 **5 Claims**



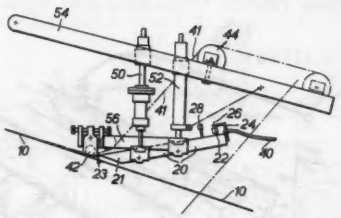
A feed hopper includes a bottom discharge opening which discharges seeds into a tubular body means. A seed distributing cone is disposed at a central part of the body means beneath the hopper discharge. A disc is rotatably supported beneath the cone and means is provided for feeding treating fluid onto such disc. Flow control means is disposed outwardly of the cone and includes a plurality of spaced generally cylindrical concentric tubular members, the upper edges of the outer cylindrical members being disposed vertically above the upper edges of the cylindrical members disposed inwardly thereof. These cylindrical members are spaced from the cone and from one another so as to provide uniform flow of seeds around said disc at varying rates of feed.

3,605,689
DEVICE FOR EVENLY DISTRIBUTING A FLOWABLE MASS

Robert E. Sherwood, Cincinnati, Ohio, assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Aug. 12, 1969, Ser. No. 849,396
Claims priority, application Germany, Aug. 13, 1968, P 17 79 450.2
Int. Cl. B05c *3/00*
U.S. Cl. 118—407 **11 Claims**

A device for overcoming difficulties in the continuous distribution of a relatively quickly solidifying flowable mass over a relatively broad surface where a layer of uniform thickness is required and no air or gas bubbles should be produced in the mass. In prior art devices damming by a distributor causes a greater hydrostatic pressure at the centre with consequent thickening of the centre portion of the distributed layer. A large container with a discharge slit cannot be used where the mass solidifies too quickly to be wholly discharged before solidification. The device comprises a distributor plate hava surface inclined in the direction of flow, a feed line for discharging the flowable mass onto the inclined surface of

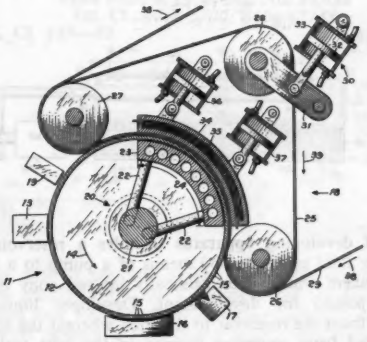


the distribution plate, a predistributor narrower than the desired final extent of spreading located downstream of the feed line and spaced from the surface of the plate for initially spreading the flowable mass widthwise of the plate, and a main distributor arranged downstream of the predistributor and spaced from the surface of the plate for distributing to the full width the initially distributed mass, and means for varying the spacing of the distributors from the plate surface for controlling the thickness of the layer to be formed.

3,605,690
PRINTING APPARATUS FOR TRANSFERRING MAGNETIC PARTICLES TO A PAPER

Karel J. Staller, Rutherford, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

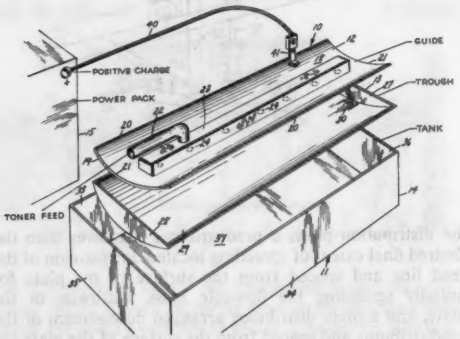
Filed Mar. 18, 1970, Ser. No. 20,712
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **10 Claims**



A printing apparatus is provided to transfer attaching plastic magnetic particles to a paper, wherein the particles are squeezed between a magnetic drum and a paper using a stretched metallic belt. The metallic belt is heated and moved at the same speed as the paper such that the combination of pressure and heat decreases the melting point

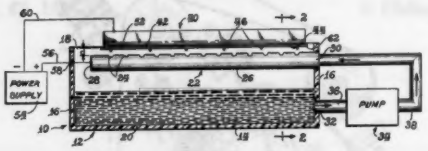
of the plastic particles and causes them to be transferred from the drum to the paper.

3,605,691
MEANS FOR CHARGING ELECTROSTATIC LIQUID TONER
David L. Herman, Scarsdale, N.Y.
(801 E. 136th St., New York, N.Y. 10454)
Filed June 18, 1969, Ser. No. 834,274
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 2 Claims



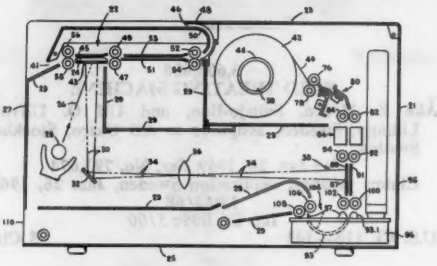
Means for imparting a positive charge to liquid toner as the same is sprayed upon exposed sensitized paper, the toner having a charge opposite that of the unexposed areas on the paper to which the toner is to be attracted.

3,605,692
ELECTROSTATIC LIQUID DEVELOPING APPARATUS
William R. Maloney, Deerfield, and Richard J. Pleitt, Chicago, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Filed July 2, 1969, Ser. No. 838,396
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 6 Claims



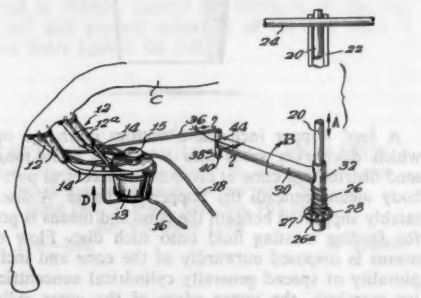
Liquid developing apparatus includes a reservoir of developer fluid connected by means of a pump to a feed tube adjacent which electrostatically imaged copy material is passed for development. Developer liquid is pumped from the reservoir to the tube whereat the liquid is expelled from apertures formed in the tube wall. A knife edge electrode is spaced from the feed tube opposite the apertures. The feed tube and knife edge electrode are connected to a voltage source to provide a biasing effect, causing toner particles to be attracted toward the knife edge electrode and to accumulate within the developer liquid near the copy material thereby to aid in the development thereof without wetting the copy material excessively.

3,605,693
DEVELOPMENT ELECTRODE
Gilbert Zweig, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Sept. 9, 1969, Ser. No. 856,441
Int. Cl. B05b *5/02*; G03g *13/10*
U.S. Cl. 118—637 8 Claims



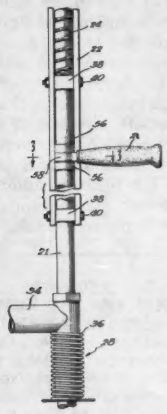
A porous, electrically floating electrode, such as a metal screen, is employed in a liquid toner process for electrostatic image development.

3,605,694
MILKER SUPPORT WITH SLACK TAKE UP
Chester A. Thomas, Lake Forest, and Robert J. Shulick, St. Charles, Ill., assignors to Babson Bros. Co.
Filed Aug. 20, 1969, Ser. No. 851,630
Int. Cl. A01j *7/00*
U.S. Cl. 119—14.1 5 Claims



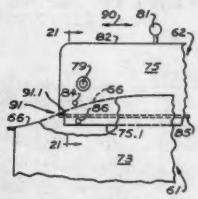
A supporting mechanism for a milking apparatus which includes a vertically adjustable member having a generally horizontally disposed arm member mounted thereon, the arm having a free end operatively connected to and supporting a milk receiving receptacle beneath a cow. The arm is of a strength sufficient to support the receptacle when disconnected from the cow's teats. A loose connection means is provided between the arm and the adjustable member to permit limited vertical movement of the arm relative to the member between upper and lower limit positions with the receptacle hanging substantially by gravity from the cow's teats only when the arm is between those positions. Stops are provided to prevent movement of the arm above the upper limit position to prevent the teat cups of the milking apparatus from riding up the cow's teats and to prevent movement of the arm below the lower limit position to support the receptacle if the cups are disconnected from the cow's teats.

3,605,695
MILKER SUPPORT WITH CAM LOCK
Chester A. Thomas, Lake Forest, and Robert J. Shulick, St. Charles, Ill., assignors to Babson Bros. Co.
Filed Aug. 20, 1969, Ser. No. 851,640
Int. Cl. A01j 7/00
U.S. Cl. 119—14.1 6 Claims



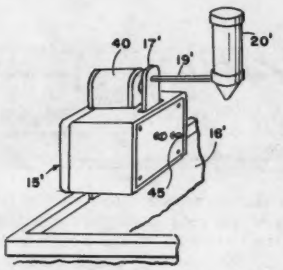
A mechanism for adjustably supporting a milking apparatus, including a vertically disposed elongated member which is constrained for longitudinal movement in a vertical channel member and which carries the milking apparatus for vertical movement therewith beneath a cow. A lever is movable with the elongated member and has an eccentric cam portion which cooperates operatively with a cam means associated with the elongated member and the channel member to retain the elongated member in any one of a plurality of different elevational positions in response to movement of the lever.

3,605,696
AVIARY STRUCTURE
Benjamin R. Minness, 543 E. 10th Ave., Vancouver 10, British Columbia, Canada
Filed Nov. 24, 1969, Ser. No. 879,456
Int. Cl. A01k 31/06
U.S. Cl. 119—17 10 Claims



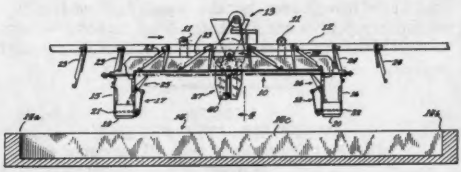
A large aviary structure adapted to protect against a creature attempting to molest a bird, aviary walls having grills of thin flat strips assembled to bars with their flat edges parallel and closely spaced. Strips are at least about half an inch in width and spaced apart a maximum distance of seven sixteenths of an inch. This construction and spacing protects the birds against, for instance, paws and claws of a cat. An additional removable sub-cage is supported on top of the aviary, a bottom opening of the sub-cage in register with a top opening of the large aviary providing access to the sub-cage, the bottom opening being closable by a sliding plate forming, when closed, a base for the sub-cage. Difficulty in catching the birds in the large aviary is reduced as the disturbed birds generally fly upwards—into the sub-cage.

3,605,697
AUTOMATIC FEEDERS FOR AQUARIUMS
George Szekely, 3123 Bailey Ave., New York, N.Y. 10463
Filed July 24, 1969, Ser. No. 844,393
Int. Cl. A01k 5/00
U.S. Cl. 119—51.11 6 Claims



A container of granular food is suspended over a fish tank, from that member of an alarm clock mechanism which vibrates to make a noise at alarm time; the duration of the alarm being a fraction of a minute. Either the clock operates in this manner, or an ordinary electric alarm clock, whose alarm duration is usually about forty minutes, is modified to reduce such interval to about ten to fifteen seconds. The discharge orifice at the bottom of the container may be changed to accommodate a food supply of different fineness. The container may be replaceable, refillable, or constitute a cartridge to be received in an adaptor. When the clock is of the electrically operated type, said vibrating member is the armature of a buzzer, upon the operation of which, the container is shaken.

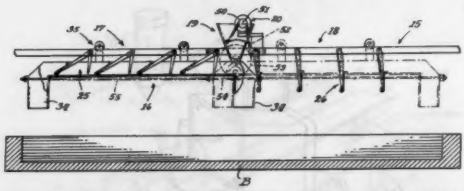
3,605,698
SWEEP SHUTTLE FEEDER WITH AUTOMATIC LATERAL DIVERTER
Michael M. Thyberg, Walworth, Wis., assignor to Starline, Inc.
Filed Mar. 4, 1970, Ser. No. 16,435
Int. Cl. A01k 5/00; B65g 47/44
U.S. Cl. 119—52 11 Claims



An animal feeding device, commonly known as a sweep shuttle feeder, has a trough with a discharge chute at each end which reciprocates longitudinally in a path of travel beneath a feed supply source and above a feed bunk, and sweep means causes feed received in the trough from the supply source to be discharged through one chute or the other and scattered along the feed bunk as the trough reciprocates. The feed bunk is provided with a longitudinal partition, and lateral diverter panels are pivotally mounted in the discharge chutes for movement between first and second inclined positions to direct feed toward one side or the other of the partition. Pivoted control arms and linkage means on the chutes move the

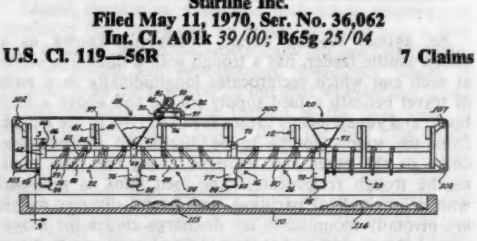
diverter panels from one position to the other in response to the operation of actuating means which are remotely controllable by an operator.

3,605,699
SWEEP SHUTTLE FEEDER
Robert G. Ferris, Harvard, and Allen K. Gillette, Belvidere, Ill., assignors to Starline, Inc.
Filed Mar. 4, 1970, Ser. No. 16,436
Int. Cl. A01k *5/00*; B65g *25/04*
U.S. Cl. 119—56R **10 Claims**



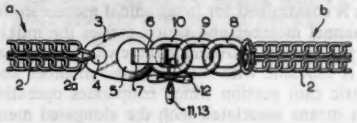
A sweep shuttle animal feeder of the type having a feed trough which reciprocates above a feed bunk that is about twice the length of the trough so that feed deposited in the reciprocating trough from a feed supply station above the mid point of the bunk may be dropped from the trough along the bunk by the action of two sets of sweep means that are pivoted above the path of travel of the trough with a set on each side of the feed supply station to selectively control relative movement between the deposited feed and the trough. The sweep means of the set through which the leading end of the trough is passing at any given time pass over the feed in the trough, while the sweep means of the set through which the trailing end of the trough is passing at any given time arrest the feed in the trough so that it drops off the trailing end. Each of the sweep means in each set includes a solid sweep panel pivotally mounted and engageable with the bottom of the trough for arresting the movement of free flowing granular material and also including sweep tines pivotally mounted about the same axis as the sweep panel for arresting the movement of dense material which the panel may not penetrate, both the sweep panels and the sweep tines being permitted free movement through a vertical plane when the trough is not under the sweep means to minimize material squeezing between the sweep panel and the sweep tines. There being further provided an interconnection between the sweep tines and the sweep panel to limit the maximum annular movement therebetween so that when the sweep panel rides in the trough on either the trough floor or feed thereon, the sweep tines are prevented from rotating through a vertical plane and are maintained in an operative sweeping position.

3,605,700
SWEEP SHUTTLE FEEDER
Allen K. Gillette, Belvidere, Ill., assignor to Starline Inc.
Filed May 11, 1970, Ser. No. 36,062
Int. Cl. A01k *39/00*; B65g *25/04*
U.S. Cl. 119—56R **7 Claims**



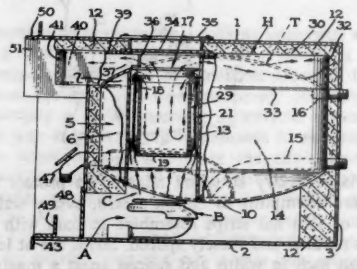
A sweep shuttle animal feeder having the capability of delivering more than two feed lots or rations to a longitudinally partitioned feed bunk including a feed trough having four discharge chutes which reciprocates above the feed bunk with at least two feed supply stations above the feed trough to deposit feed in the trough with the feed supply stations being spaced a distance approximately equal to the discharge chute spacing, there being provided a set of sweep means on each side of each of the feed supply stations. The sweep means of the sweep sets adjacent one side of each of the feed supply stations being constructed to discharge feed through two of the discharge chutes while the trough moves in one direction, and the sweep means associated with the other side of each of the supply stations being effective to discharge feed from the other two discharge chutes while the trough moves in the opposite direction. There is further provided a selectively positionable diverter panel in each of the feed discharge chutes on the trough to selectively direct feed to either side of the partition in the bunk, which gives the entire feeder the capability of depositing four separate feed lots in the feed bunk.

3,605,701
LINK CHAIN COLLAR FOR ANIMALS, ESPECIALLY DOGS
Herbert Alfred Sprenger, Iserlohn, Germany, assignor to Herm. Sprenger, Iserlohn, Germany
Filed May 5, 1969, Ser. No. 821,744
Claims priority, application Germany, May 11, 1968, S 64,933
Int. Cl. A01k *27/00*
U.S. Cl. 119—106 **4 Claims**



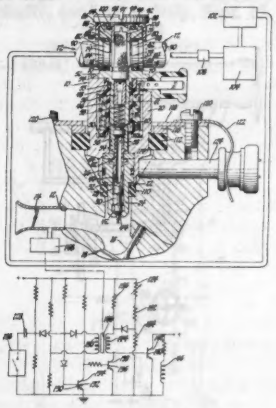
A link chain collar for animals, especially dogs, which comprises a first link chain having its end portions secured to a hook-shaped fastener and to a second link chain, respectively. Any desired link of the second link chain can be brought into and out of engagement with the hook-shaped fastener so as to adjust the length of the collar to the circumference of the neck of an animal.

3,605,702
HOT WATER HEATER
Harry E. Thompson, Steubenville, Ohio, assignor to Peerless Division, Dover Corporation, Louisville, Ky.
Filed July 1, 1969, Ser. No. 838,218
Int. Cl. F22b *7/00*
U.S. Cl. 122—234 **16 Claims**



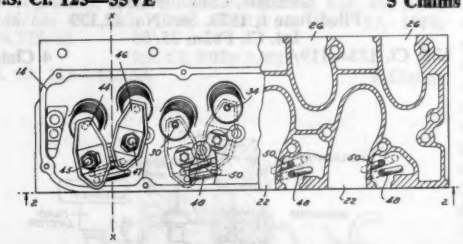
A heating device having a vertical flue tube extending through a water tank. Baffle means are disposed within the flue tube and includes flue gas directing elements serving to both retain and radiate absorbed heat. A flue collector surrounding the tank top receives the gases from the tube and directs the gases over the tank top wall before discharge through a vent duct.

3,605,703
FUEL INJECTION
John W. Moulds, Penfield, N.Y., assignor to General Motors Corporation, Detroit, Mich.
Filed May 22, 1970, Ser. No. 39,627
Int. Cl. F02m *51/00*
U.S. Cl. 123—32J 1 Claim



A solenoid operated fuel injector discharges into an internal combustion engine induction passage adjacent the combustion chamber intake port. Fuel is supplied to the injector through a tubular fuel rail which is received by and clamped in a recess at the top of the injector. A thermistor senses injector tip temperature and controls the duration of energization of the solenoid to compensate for a reduction in fuel delivery at high temperatures.

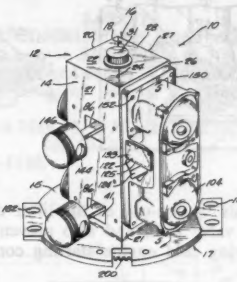
3,605,704
VALVE ACTUATION MECHANISM WITH CROSSED AXES PUSHRODS
Robert C. Gardner, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Apr. 30, 1970, Ser. No. 33,394
Int. Cl. F02b *75/22*; F01l *1/14, 1/18*
U.S. Cl. 123—55VE 5 Claims



An internal combustion engine having pairs of intake and exhaust pushrods in which the axes of each pair of pushrods are crossed when the engine is viewed laterally and positioned both to one side of the corresponding intake passage. This permits the intake passages formed within the cylinder head to be more effectively directed and significantly increased in cross-sectional area and engine performance to be correspondingly improved.

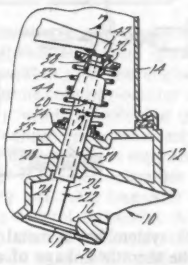
3,605,705
OPPOSED PISTON MULTICYLINDER ENGINE
Kurt F. Ziegler, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed July 8, 1969, Ser. No. 839,832
Int. Cl. F02b *75/22, 75/24*; F01b *1/06*
U.S. Cl. 123—55A 15 Claims

Disclosed herein is an engine construction for a family of lightweight and compact internal combustion engines which can have 4 or 8 or more cylinders. The engine crankcase is generally in a form of a square prism with two crankcase sections which are cast from the same mold, and which abut along a diagonal interface which



extends through the axis of rotation of the crankshaft. Pairs of oppositely acting pistons are arranged around the four faces of the prism. The pistons reciprocate in cylinders which are secured to the crankcase faces.

3,605,706
VALVE STEM OIL DEFLECTOR
Jack A. Bush, Birmingham, Mich., assignor to Microdot Inc., New York, N.Y.
Filed Dec. 12, 1969, Ser. No. 884,554
Int. Cl. F01l *3/06*; F16j *15/32, 9/04*
U.S. Cl. 123—90.37 3 Claims

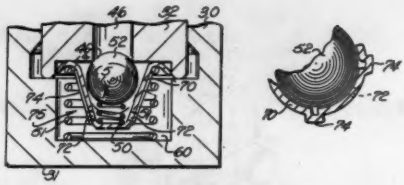


An oil deflector adapted to be mounted on the stem of a valve of an internal combustion engine comprises a generally cup-shaped molded thermoplastic member having a radially extending wall section and an integral axially extending ribbed skirt section; the wall section including an interiorly extending thickened neck section defining a tapered bore adapted to receive the valve stem therewithin.

3,605,707
HYDRAULIC VALVE LIFTER WITH PUMP-UP PREVENTION MEANS
Gerald D. Line, Saginaw, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Dec. 4, 1969, Ser. No. 882,224
Int. Cl. F01l *1/24*
U.S. Cl. 123—90.57 1 Claim

A hydraulic valve lifter includes body and plunger members which cooperate to define a pressure chamber. The hydraulic valve lifter includes means for preventing "pump-up" of the lifter under the influence of surging of an engine valve spring and for minimizing lash in the valve train at cold engine starting conditions. The means for preventing "pump-up" includes a check valve member, movable between a first limit position in which the valve

member blocks a flow of fluid to the pressure chamber and a second limit position in which there is a restricted flow of fluid to the pressure chamber. This restricted flow



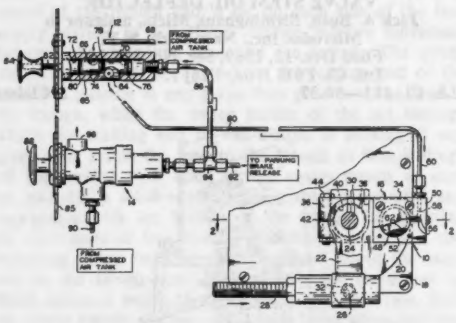
of fluid prevents "pump-up" of the lifter during surging of the engine valve train and also prevents lash in the valve train during cold engine starting conditions.

3,605,708

THROTTLE LOCKING SYSTEM

Wilbert F. Jordan, 2148 SE. Salmon St., Portland, Oreg. 97214

Filed Oct. 29, 1969, Ser. No. 872,243
Int. Cl. F02d *11/02*; F02b *77/00*; F16d *55/00*
U.S. Cl. 123—98 **9 Claims**



A throttle lock system has a metal plate connected to and moved by the throttle linkage of a truck engine in a direction parallel to the faces of the plate. Plungers positioned on opposite sides of the plate and mounted in stationary cylinders are moved toward the opposite faces of the plate by compressed air under control of a manually actuated valve to clamp the plate and lock the throttle in selected position. The system is used to set the speed of the engine of a freight truck to maintain air conditioning or heating equipment and the like in operation when the truck is parked. The system includes an automatic release for the throttle lock whenever the spring brakes employed on such trucks are released so that the throttle will not be locked when the truck is in motion.

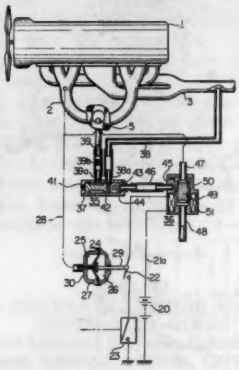
3,605,709

VEHICULAR AIR-POLLUTION PREVENTIVE SYSTEM

Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 11, 1970, Ser. No. 18,662
Claims priority, application Japan, Mar. 19, 1969, 44/20,596
Int. Cl. F02m *25/06*; F02d *19/00*
U.S. Cl. 123—119A **5 Claims**

A vehicular air-pollution preventive system for use with an internal combustion engine, which system is adapted to reduce the quantity of nitrogen oxides produced during acceleration or hill-climbing in such quantities as to cause a serious air-pollution problem especially when the vehicle is driven in urban areas, having two switches closing when the vehicle is driven at a speed



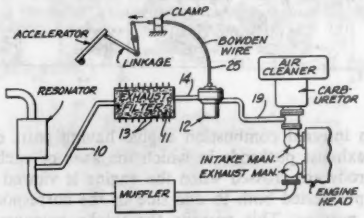
falling within a predetermined range and with the intake manifold vacuum lower than a predetermined level providing acceleration or hill-climbing and an exhaust recirculation control valve assembly which is adapted to pass the exhaust gases to the intake manifold when both of the two switches are closed concurrently.

3,605,710

APPARATUS AND METHOD FOR IMPROVING GASOLINE COMBUSTION IN INTERNAL COMBUSTION ENGINES

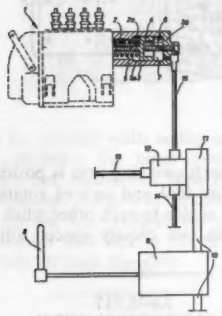
Carl W. Helwig, 906 Crestview Ave., Glendale, Calif. 91202

Filed June 1, 1970, Ser. No. 42,379
Int. Cl. F02m *25/06*
U.S. Cl. 123—119A **4 Claims**



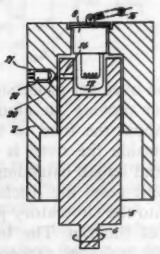
An apparatus and method for improving gasoline combustion in internal combustion engines. Lead is now added to gasoline to retard its combustion. The present invention eliminates lead and utilizes a deliberate feedback of exhaust fumes to the intake manifold to improve the combustion through slower burning of the gasoline. Exhaust fumes pass through an exhaust filter and cooler to a control valve assembly. Depression of the accelerator automatically controls the flow of exhaust fumes from the control valve assembly to the intake manifold, where such fumes are mixed with the gasoline.

3,605,711
DEVICE FOR LIMITING THE SUPPLY OF FUEL TO A DIESEL ENGINE AS A FUNCTION OF THE ENGINE EXHAUST TEMPERATURE
Oscar Fuso, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy
Filed Sept. 9, 1969, Ser. No. 856,291
Claims priority, application Italy, Sept. 19, 1968, 53,200/68
Int. Cl. F02d 7/00
U.S. Cl. 123—140MC 3 Claims



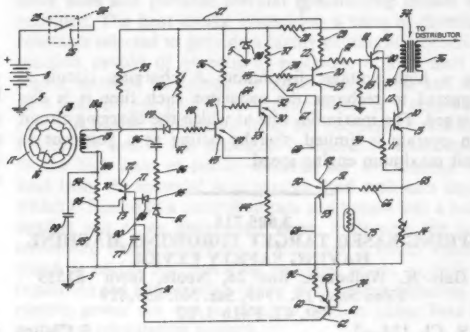
This invention provides a device which is effective automatically to limit the range of permitted movement of a fuel supply control element in response to a temperature sensed in the engine exhaust gases when said temperature exceeds a given threshold value. Overheating of the engine when working in rarefied air is thereby avoided.

3,605,712
IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES
Eric Harold Ford, London, England, assignor to Lumenition Limited, London, England
Filed Feb. 24, 1969, Ser. No. 801,721
Claims priority, application Great Britain, Feb. 29, 1968, 946/68; Oct. 22, 1968, 50,102/68; Nov. 19, 1968, 54,775/68
Int. Cl. F02p 3/02
U.S. Cl. 123—146.5A 9 Claims



In an ignition system of an internal combustion engine the provision of a device for fast switching the primary circuit, this device including an infra-red radiation source and an infra-red radiation sensitive element, the radiation path being interrupted in timed relation to the engine revolutions whereby switching current is provided which is amplified for fast switching transistorized elements and applied to the primary winding of the ignition coil. Advance or retard of the ignition system can be achieved in relation to speed and/or load conditions on the engine by altering the line of sight between the radiation source and the radiation sensitive element in relation to a device which interrupts the radiation in timed relation to the engine revolutions.

3,605,713
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM
Paul D. Le Masters and James E. Shearer, Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed May 18, 1970, Ser. No. 38,351
Int. Cl. F02p 3/02
U.S. Cl. 123—148E 9 Claims

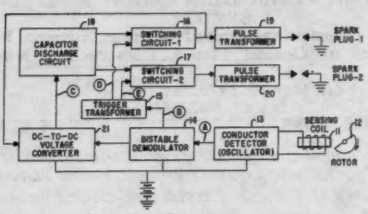


An internal combustion engine ignition system of the type responsive to alternating current ignition signals produced in time relationship with the engine. The ignition coil primary winding, the collector-emitter electrodes of an ignition coil primary winding switching transistor and a control resistor are connected in series across the battery and forward base-emitter current is supplied to the switching transistor through the collector-emitter electrodes of a coil primary winding switching transistor and a control normally conducting control transistor. A trigger circuit is responsive to each selected half cycle of the alternating current ignition signals to establish a shunt circuit which shunts base-emitter current from the control transistor to extinguish this device and, consequently, the switching transistor whereby the switching transistor is operated conductive and not conductive in timed relationship with the engine. Another transistor, responsive to the potential developed across the control resistor, shunts base-emitter current from the control transistor to limit ignition coil primary winding energizing current to a predetermined magnitude and another transistor, also responsive to the control potential, establishes the electrical angle of each cycle of the alternating current ignition signals at which the control transistor conducts to determine the length of time energizing current flows through the ignition coil primary winding.

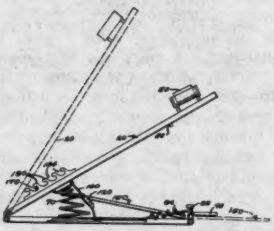
3,605,714
CONTACTLESS IGNITION SYSTEM
James T. Hardin, Lambertville, Mich., and William J. Roberts and Maximillian Kusz, Toledo, Ohio, assignors to Eltra Corporation, Toledo, Ohio
Filed June 11, 1969, Ser. No. 832,217
Int. Cl. F02p 3/02
U.S. Cl. 123—148E 7 Claims

An ignition system for alternately firing two spark plugs in an internal combustion engine. A rotor is used to modulate the output signal of an oscillator, which in turn

triggers a bistable demodulator to produce a square wave synchronized with the engine. The square wave is used to alternately fire two silicon controlled rectifiers for alternately discharging a storage capacitor through the primary windings of two ignition transformers, eliminating the need for a high voltage distributor. A charging circuit is triggered to recharge the capacitor each time it is discharged. The maximum rate at which the charging circuit can operate is limited, thereby acting as a governor to limit maximum engine speed.



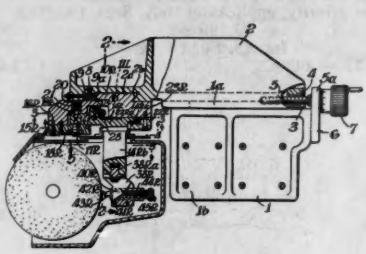
3,605,715
SPRING-BASED TARGET THROWING MACHINE HAVING SAFETY LEVER
Dale K. Welbourn, Box 26, Neola, Iowa 51559
Filed Sept. 19, 1969, Ser. No. 859,429
Int. Cl. F41b *3/02*
U.S. Cl. 124—7 **5 Claims**



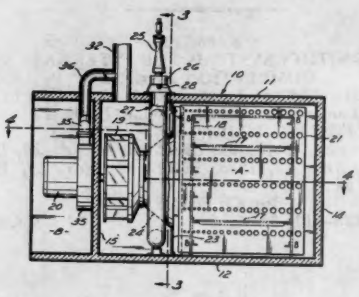
A target throwing machine of a catapult type having a throwing arm arresting means comprising a safety lever and a row of spaced detents arranged along the throwing arm and engageable by the safety lever as the throwing arm is depressed for preventing the throwing arm from springing up at an undesired time and perhaps causing serious injury.

3,605,716
DOUBLE CIRCULAR GRINDSTONE DRESSING APPARATUS
Makoto Kikuchi, Asahimachi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Aichi Prefecture, Japan
Filed Feb. 27, 1970, Ser. No. 15,026
Claims priority, application Japan, Feb. 27, 1969, 44/14,960
Int. Cl. B24b *53/04*
U.S. Cl. 125—11A **6 Claims**

Apparatus for dressing pair of closely spaced adjacent grindstones of type having circular peripheral faces with different centers comprises framework with cutting table slidably mounted thereon for movement normal to axis of rotation of grindstones. Two swinging members are pivotally connected relative to cutting table and each member has arm depending therefrom with dressing tool connected to free end of each arm. Swinging members swing in plane parallel to horizontal plane defined by axis of rotation of grindstones and tip of each tool. Driving mechanism synchronously swings swinging members. Dressing tool on each swinging arm is positioned so that axis of one dressing tool and axis of rotation of grindstones are at right angles to each other when one of tools is midway between two closely spaced adjacent grindstones.



3,605,717
CONVECTION OVEN
Paul H. Sauer, Burg-Dillkreis, Germany, assignor to Crown-X, Inc., Cleveland, Ohio
Filed Nov. 10, 1969, Ser. No. 875,370
Int. Cl. F24c *15/32*
U.S. Cl. 126—21A **12 Claims**

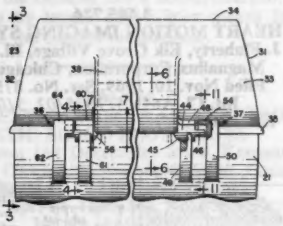


A gas-fired convection oven for processing food, for example, having a fan for moving air along a circulatory path over, along and about the food to be processed. A gun-type gas burner outside the oven is directed into a burner tube of substantial length extending into the oven. High-temperature exhaust gases are discharged from the burner to be directed into the circulatory path of air adjacent the exhaust side of the fan. The burner tube also provides substantial heat-exchange exposure to the circulating air.

3,605,718
VENT AND HINGE FOR GAS GRILL
Mellie E. Winters, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed June 30, 1969, Ser. No. 837,612
Int. Cl. A47j *37/00;* **B65d** *43/16;* **E05d** *1/06*
U.S. Cl. 126—25 **12 Claims**

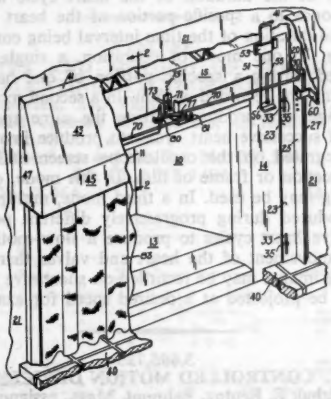
A gas grill is provided with a flue vent and hinge means which are integrally formed with the grill by casting. The vent curves outwardly from the rear of the grill

cover, and a pair of hinge pins extend laterally from the vent. The hinge pins are rotatably supported by hinge brackets which extend outwardly from the rear of the grill casing, and each hinge pin includes a retainer bar portion which extends under an arcuate retainer wall on the grill casing. Each retainer wall is provided with a slot there-

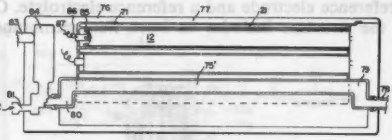


through, and the retainer walls acting against the retainer bar portions maintain the hinge pins on the support brackets to prevent inadvertent separation of the cover from the grill casing. The grill cover can be removed when desired by aligning the retainer bar portions with the slots in the retainer wall and by lifting the cover to pass the retainer bars through the slots.

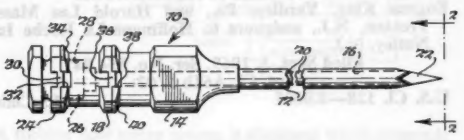
3,605,719
FIREPLACE HOOD AND TRIM STRUCTURE
George M. Andrews, Syracuse, N.Y., assignor to Vega Industries, Inc., Syracuse, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,110
Int. Cl. F24c *15/06*
U.S. Cl. 126—139 **7 Claims**



The hood and trim structure is used in conjunction with prefabricated metal fireplaces installed in building walls. The trim structure includes a trim strip detachably mounted along the outer edge of each side column of the fireplace and overlaps the spaces between the sides of the fireplace and the sides of the wall opening. These strips are conveniently adjustable vertically to accommodate hearth extensions of different thicknesses. The hood overlies the header of the fireplace and the top of the hood is cammed tightly against the wall surface by locking bars which may be conveniently moved downwardly to unlocking position to permit outward movement of the hood for removal when a lintel, or a mantel, is erected directly above the hood. Means is provided for attaching the ends of the hood to the vertical trim strips regardless of the vertical position to which they have been adjusted.

3,605,720
HEAT SOURCE SYSTEMS
Kenneth E. Mayo, Nashau, N.H., assignor to Sanders Nuclear Corp., Nashua, N.H.
Filed Mar. 16, 1970, Ser. No. 19,879
Int. Cl. B63c *11/28*; F24h *7/02*; F24j *1/00*
U.S. Cl. 126—263 **24 Claims**

High thermal energy density rate controlled heat source systems particularly suitable for use in heated underwater diver suits and portable thermal conditioning jackets are provided. The heat source system has a mass of chemical reactants selected to provide a highly exothermic chemical reaction devoid of gaseous by-products. A high heat of fusion material surrounds the mass of reactants and acts as a heat storage unit for dissipating heat at a controlled rate which heat is obtained from the exothermic reaction. Preferably means are provided in operative relationship to the high heat of fusion material for transferring the heat from the material to a moving fluid such as a liquid which is heated at a controlled rate and passed into a body heating suit of an underwater diver. Preferably the last-mentioned means comprises a boiler and a steam injector which is useful for providing pumping action as well as regulating the temperature of the fluid so that batteries or electric power are not required to provide either heat or pumping (circulation power).

3,605,721
BIOPSY NEEDLE
Ismet Hallac, 94 Sudbury Lane, Williamsville, N.Y. 14221
Filed Nov. 3, 1969, Ser. No. 873,343
Int. Cl. A61b *5/10*
U.S. Cl. 128—2B **10 Claims**



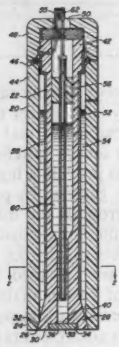
A composite disposable biopsy needle comprising an inner needle disposed within an outer needle and fixedly secured thereto. The distal ends of the needles are provided with coextensive sets of prongs terminating in tissue piercing apexes. The distal end of the inner needle is joined to the body portion thereof by a weakened wall portion adapted to collapse upon relative rotational movement between the inner and outer needles to sever and capture a biopsy specimen in the inner needle.

3,605,722
METHOD OF DIAGNOSING CYSTIC FIBROSIS
John H. Riseman, Cambridge, and Stanley Shiller, Needham, Mass., assignors to Orion Research Incorporated, Cambridge, Mass.
Continuation-in-part of application Ser. No. 621,895, Mar. 9, 1967. This application Nov. 18, 1969, Ser. No. 877,708
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1R **1 Claim**

A method for electrochemically diagnosing cystic fibrosis by wetting the cleansed skin of a patient with a solution containing chloride ions in a concentration of about

forty (40) milliequivalents per liter and then determining the direction of drift of a signal developed by a chloride response electrode in contact with the patient's skin.

This technique is advantageously carried out with an electrochemical electrode structure having an elongated body with an axial chamber and an annular chamber, both separated from one another. Both chambers contain a reference electrode and a reference electrolyte. One end of the structure includes an inset, flat, membrane sensi-



tive to specific ions of one polarity forming a wall for the axial chamber.

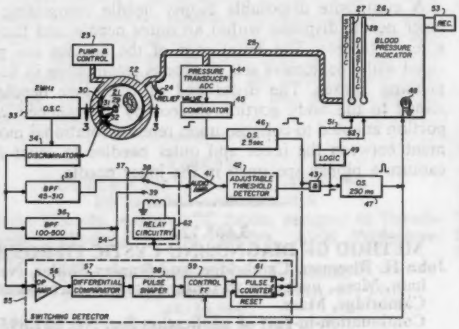
In one form of the electrode, an annular leak, communicating with the annular chamber, surrounds and is spaced from the membrane surface, that end of the structure therefore providing a substantially flat, ridgeless surface. In another form, a ring-shaped membrane, sensitive to ions of opposite polarity, surrounds and is spaced from the central membrane, and no leak is used.

3,605,723

BLOOD PRESSURE MONITOR

Eugene King, Yardley, Pa., and Harold Lee Massie, Trenton, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 3, 1969, Ser. No. 854,847
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05M **15 Claims**



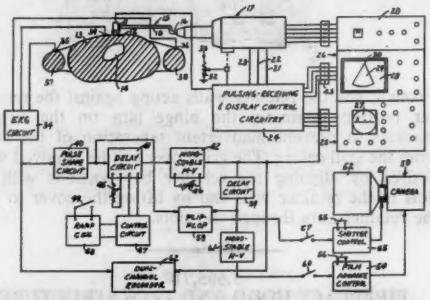
Apparatus for automatically implementing indirect arterial blood pressure measurement with a transmitter-receiver operation for deriving Doppler shifted information due to arterial wall movement under external pressure, by observing and selectively monitoring electrical Doppler signals representative of the information through a filter arrangement operating in a first and second band pass frequency range, where the second band pass frequency range is employed instead of the first on the basis of certain criterion observed in monitoring the arterial movement.

3,605,724

HEART MOTION IMAGING SYSTEM

John J. Flaherty, Elk Grove Village, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Nov. 10, 1969, Ser. No. 875,312
Int. Cl. A61b *5/10, 5/02, 5/04*
U.S. Cl. 128—2R **15 Claims**



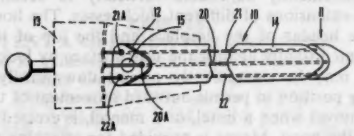
Heart motion imaging system in which a rapidly moving ultrasonic beam transversely scans a beating heart and in which a complete image corresponding to a cross-section of the beating heart is produced on an oscilloscope screen during a time interval which is a small fraction of the duration of the heart cycle and which corresponds to a specific portion of the heart cycle, the time and duration of the time interval being continuously variable. In one mode of operation, a single image is produced during a specific portion of one heart cycle, which may be recorded on film. In a second mode, multiple images are produced during the same specific portions of successive heart cycles to produce images which are integrated on the oscilloscope screen and/or on a single section or frame of film. In this mode, compound scanning may be used. In a third mode, multiple images are produced during progressively different portions of successive heart cycles to produce a slow motion showing of movement of the heart and valves thereof. Such multiple images may be recorded on successive frames of film to be projected at a desired speed for examination.

3,605,725

CONTROLLED MOTION DEVICES

Itzhak E. Bentov, Belmont, Mass., assignor to Medi-Tech Incorporated, Belmont, Mass.

Continuation-in-part of application Ser. No. 667,296, Sept. 12, 1967. This application Aug. 7, 1968, Ser. No. 756,714
Int. Cl. A61m *25/00*
U.S. Cl. 128—2.05R **8 Claims**



Controlled motion devices are provided, which may be in the form of a controlled catheter for use in the body,

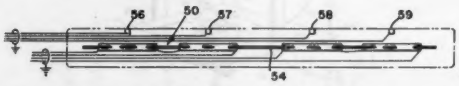
having an elongated flexible tube member with a rear end and a central axis. A forward section of the tube forms a catheter tip and control means extend through the member from the rear end to the tip to cause bending of the tip at selected angles with respect to the central axis upon suitable actuation. A control mechanism is designed for use in controlling movement of the catheter tip. Preferably the catheter has a non-cylindrical, varying diameter along its length and carries means for rapid connection with the control mechanism.

3,605,726

FLEXIBLE, EXTRA VASCULAR ELECTROMAGNETIC BLOOD FLOW PROBE

Bryn T. Williams, 164 Dorchester Road, Kenmore, N.Y. 14217, and Charles A. Barefoot, 3800 Cash Drive, Winston-Salem, N.C. 27107

Filed Apr. 14, 1969, Ser. No. 815,918
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05F **10 Claims**



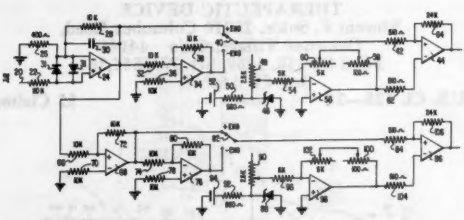
A flexible and non-surgically removable electromagnetic blood flow probe suitable for introduction into living creatures to measure relatively and quantitatively the velocity, volume or change of blood flow through selective blood vessels and organs. The probe is positioned at the time of surgery for use operatively and post-operatively, and because of its flexibility, size and shape, it can be removed from the living creature without further surgery. It is formed by enclosing a flux forming coil having cooperating electrodes for sensing a voltage generated by conductive blood with a flexible cover.

3,605,727

APPARATUS AND METHOD OF MONITORING AND EVALUATING ELECTROCARDIAC TRACES

George Zenevich, 246 Hillcrest Ave., Hubbard, Ohio 44425, and Leonard P. Caccamo, 45 Redfern Drive, Youngstown, Ohio 44505

Filed Sept. 4, 1968, Ser. No. 757,346
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06A **14 Claims**



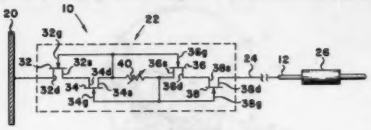
An apparatus for and a method of evaluating electrocardiac traces to determine heart conditions. The trace is applied to first and second comparison means which provide respectively first and second output indications when the trace exceeds first and second comparison levels. One comparison level is set, for example, to detect the R wave in each electrocardiac complex within the trace. The other comparison level is set to detect, by way of examples, each ectopic R wave of an abnormally high magnitude, or each P wave, each R wave, and each T wave, or after inversion each Q wave and each S wave. From counts of the numbers of detected waves, various ectopics heart conditions can be determined and evaluated.

3,605,728

CURRENT LIMITING SAFETY ELECTRODE LEAD

John S. Ogle, Sunnyvale, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 19, 1969, Ser. No. 834,775
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06R **3 Claims**



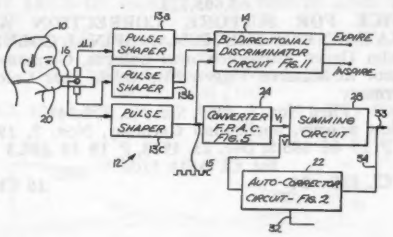
A safety lead system for the transmission of bioelectrical signals from a patient to biomedical electronic equipment and for patient grounding. Each lead has an integral unpowered semiconductor current limiting circuit at the electrode which provides linear low impedance transmission of the bioelectrical signal but limits current flow through the lead to a preset maximum level below that which is harmful to the patient, regardless of the polarity and intensity of accidentally applied currents and voltages.

3,605,729

FLUID FLOW METER SYSTEM

Frederick F. Liu, Northridge, Ted W. Berwin, Los Angeles, and Marvin Q. Lee, Granada Hills, Calif., assignors to Respiratory Bioelectronics Systems, Inc., Tarzana, Calif.

Filed Apr. 13, 1970, Ser. No. 27,667
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **18 Claims**



A turbine flow meter system is disclosed which responds to respiratory flow rate of a patient. The flow meter system includes apparatus for indicating the direction of flow in the flow meter to distinguish inspiration from expiration. An electronic correlation scheme performs on line electronic correction of dynamic errors created in the turbine associated flow meter system. The correction scheme makes adjustment to the output of the flow meter system so that accurate simulation of the dynamic characteristic corrects the output therefrom.

3,605,730

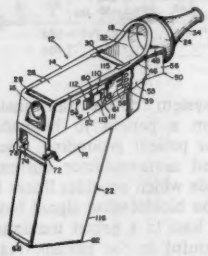
ILLUMINATING ENDOSCOPE WITH IMPROVED GRIPPING MEANS

John E. Hotchkiss, Corte Madera, Calif., assignor to Hotchkiss Instruments, Inc.

Continuation-in-part of application Ser. No. 675,811, Oct. 17, 1967. This application Aug. 27, 1968, Ser. No. 755,661
Int. Cl. A61b *1/22*
U.S. Cl. 128—9 **8 Claims**

An endoscope for illuminating and viewing an area of an organ, having a housing with aligned viewing and sight apertures and a pair of oppositely disposed holding surfaces on the exterior of the housing adjacent the sight

aperture enabling the holding of the housing with the thumb and a finger of a holding hand so that remaining fingers of that hand are positioned to manipulate and move the organ. The housing includes an interface for mechanically mounting an electrical power source to the housing which energizes a light source in the housing. A pressure-sensitive switch is disposed adjacent the sight aperture for actuation by a finger holding the housing. The



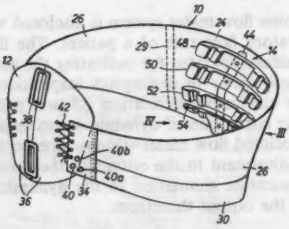
power source is located on the side of the holding thumb generally opposite the remaining fingers of the holding hand to prevent the power source from interfering with the use of the remaining fingers for manipulation of the organ. The power source is selected from conventional batteries, rechargeable batteries, and household current drawing transformers. Terminals electrically connecting the light source with the power source are constructed to simultaneously releasably secure the latter to the housing.

3,605,731

DEVICE FOR SUPPORT, CORRECTION AND TREATMENT OF THE HUMAN SPINAL COLUMN

Wilhelm Tigges, Fischenich, near Cologne, Germany, assignor to Manfred Tigges, Fischenich, near Cologne, Germany

Filed Nov. 3, 1969, Ser. No. 870,541
Claims priority, application Germany, Nov. 2, 1968, P 18 06 685.8; Dec. 23, 1968, P 18 16 588.3
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 **15 Claims**



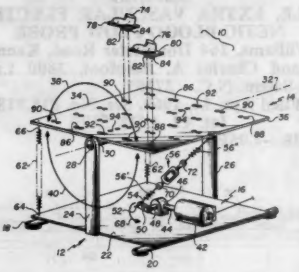
As an abdominal and back supporting belt, an elastic band with ends respectively adjustably secured to disconnectable halves of a shield-like abdominal plate; and, on the inside of a central back region defined between two sewn-in, flexible vertical stiffening ribs, an array of elongated body contact support elements pivotally carried and extending transversely to a vertical spring strip centrally secured on the back region. The vertical spacing of the elements, corresponds to the inter-vertebral disc spacing, with some freedom to change spacing as well as pivoting with body movement. Each element has at opposite ends contact pads adapted to engage the musculature on either side of individual vertebra. Back spacing lace adjustment and pad shape varying means are disclosed.

3,605,732

EXERCISING DEVICE

Joseph A. Rapoza, 148 De Kalb Ave., Jersey City, N.J. 07306

Filed Sept. 10, 1969, Ser. No. 856,569
Int. Cl. A61h *29/00*
U.S. Cl. 128—25B **9 Claims**



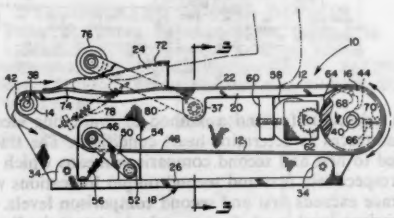
An exercising device which includes a base and a planar support surface pivotally supported above the base on an axis which permits the planar support surface to experience oscillatory motion when driven by an electric motive system positioned therebeneath. Foot retaining members are removably securable to the planar support surface at any one of a plurality of locations disposed thereon whereby with proper placement, preselected areas and muscles of a patient's feet and legs may be exercised. Preferably one or more of such locations straddles the oscillatory axis of the planar support surface whereby true dorsiflexion action of the human foot can be achieved. Additionally, one or more of such locations lie on the oscillatory axis of the planar support surface whereby with the aid of additional brackets, the foot may be subjected to an eversion-inversion action or the arm of the patient may be subjected to reciprocating rotative movement about the shoulder.

3,605,733

THERAPEUTIC DEVICE

Vincent F. Sukle, 26210 Columbus Road, Oakwood Village, Ohio 44146

Filed Oct. 10, 1969, Ser. No. 865,264
Int. Cl. A61h *1/02*
U.S. Cl. 128—26 **12 Claims**



A therapeutic device for exercising the hand and arm. The device comprises a continuous belt extrained over a pair of spaced apart rolls, and a hand engaging glove is affixed to the belt. A firm supporting surface is provided beneath the belt upper run, and the belt is positioned

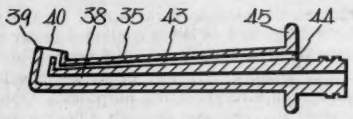
initially so that the glove is on the upper run and the patient's lower arm is supported by the surface. The belt is driven in a reciprocating manner causing the glove and patient's hand to curve around one of the rolls and return, this movement also exercising the elbow and shoulder of the patient.

The supporting surface may be provided with an undulating portion which is traversed by the glove, the device including means to press the glove into engagement with said portion to further exercise the hand.

3,605,734
MOUTH CLEANER

Teiji Igarashi and Kinji Ando, Tokyo, Japan, assignors to Cosmo Denshi Kabushikikaisha (Cosmo Electronics Corporation), Tokyo, Japan

Filed Dec. 24, 1968, Ser. No. 786,607
Claims priority, application Japan, Dec. 30, 1967, 42/110,872, 42/110,873
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **3 Claims**

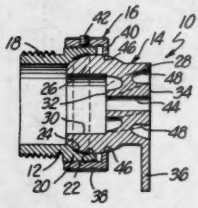


A mouth cleaner comprising a mouthpiece or a tube to be inserted into the mouth and a conduit pipe for supplying the tube with liquid, the tube being equipped at one end nozzles for jetting the liquid inward into the mouth and with an air inlet for mixing air bubbles with the liquid.

3,605,735
NOZZLE, AND POOL INCORPORATING SAME

Jacob Clyde Soden, 3851 Chapman Place, Riverside, Calif. 92506

Filed Jan. 9, 1969, Ser. No. 790,126
Int. Cl. A61h *33/00*
U.S. Cl. 128—66 **6 Claims**



A nozzle for ejecting warm water into a water exerciser pool in a pattern of expanding, swirling turbulence for body massaging purposes, and an exerciser pool system incorporating the nozzle. The nozzle is of the swivel-ball type, having a movable ball member with several water passageways spaced equidistantly apart around its axis. The passageways diverge, and spiral at a common angle of twist, between their inner and outer ends, so that water is discharged from the nozzle in streams moving in conically diverging and twisting pathways to create a condition of widespread turbulence in the pool water.

3,605,736
CERVICAL TRACTION DEVICE

Sabatino S. D'Amico, 17 Lewis Lane, Port Washington, N.Y. 11050, and Benito Tino D'Amico, Via Venturini, Fano, Pesaro, Italy

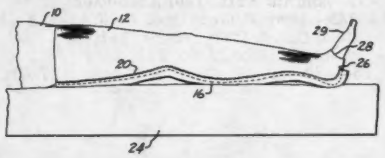
Filed Feb. 18, 1969, Ser. No. 800,134
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **9 Claims**

A traction device supported on the shoulders of a person and surrounding the head for immobilizing and supporting the same in connection with cervical defects. Shoulder saddles mount a supporting arch from which chin and neck suspension loops are pivotally suspended. Adjustment of suspension loops and suspension point locations as well as the position of the arch on the shoulder saddles, accommodates variations in size and proportions of different persons.

3,605,737
APPARATUS FOR PREVENTING BLOOD CLOTS IN THE LEGS OF HOSPITAL PATIENTS AND THE LIKE

Bernard H. Berman, 685 N. Wade Ave. Ext., Washington, Pa. 15301

Filed May 28, 1969, Ser. No. 828,540
Int. Cl. A61f *13/06*
U.S. Cl. 128—132 **6 Claims**



Described is a device, in the form of an elastic legging extending along the length of the leg for minimizing the possibility of forming clots in the legs of a bedridden patient. The legging is provided with elongated cushioning means, preferably a pair of spaced resilient cushions formed from foam rubber or inflatable balloon members which extend along the backside of the leg on either side of the center thereof whereby no pressure is exerted on the central posterior arteries or veins of the leg where blood clots are likely to occur.

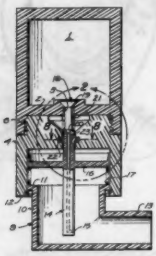
3,605,738
MEDICINAL SPRAY DEVICE

Paul J. Ciranna, 1556 N. Euclid Ave., Upland, Calif. 91780

Filed June 20, 1969, Ser. No. 835,131
Int. Cl. A61m *11/08*
U.S. Cl. 128—173 **2 Claims**

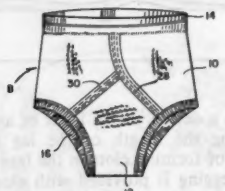
A device for producing from a pressure vessel a predetermined spray charge containing an inhalant medicine and a pressurizing aerosol, the vessel communicating with

a metering chamber which, in turn, communicates with a nozzle tube located within an ejection tube intended to be placed in suction inducing relation with a patient's mouth or nose. A first valve controls flow into the metering chamber and a second valve attached thereto controls flow through the nozzle tube and the ejection or suction tube. The first valve is manually operated to cause a predetermined quantity of the medicine-aerosol fluid to fill the metering chamber. A piston of large area supports



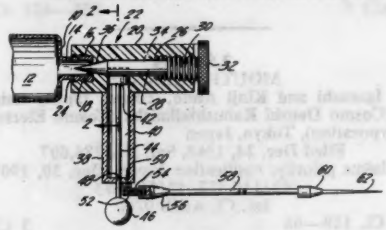
the nozzle tube and is operable, in response to suction applied by the patient to the discharge tube, to close the first valve and open the second valve and thereby cause delivery of the medicine-aerosol charge to the patient's mouth or nose simultaneously with inhalation. By means of a third valve, the metering chamber may also communicate momentarily with a chamber closed by the piston at its side opposite from the side exposed to suction pressure so as to supplement the force exerted by the patient.

3,605,739
BRIEF CONSTRUCTION
Ralph Lowery Beard and James Fred Hester, Winston-Salem, N.C., assignors to Hanes Corporation, Winston-Salem, N.C.
Filed Mar. 21, 1968, Ser. No. 714,876
Int. Cl. A61f 5/40; A41b 9/02
U.S. Cl. 128—159 **3 Claims**



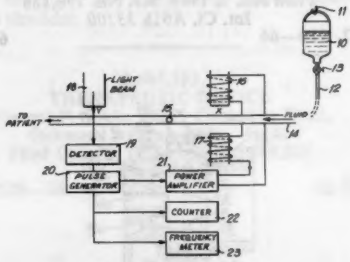
A brief is formed with a crotch portion constructed of material which is stretchable in a longitudinal direction to provide a supporting pouch for the body of a male wearer. The body portion of the garment is formed directly from a tubular section of material with a separate crotch portion being sewn thereto. Elongate binding strips for the leg openings of the brief are folded along their lengths to produce inner and outer layers which are themselves folded to produce reinforcing layers. An elastic strip is disposed between the reinforcing layers of the inner layer and captured between a double stitching arrangement used to join the binding strip to the leg openings.

3,605,740
INTRAVENOUS INJECTION APPARATUS
Howard Price, Whitestone, N.Y., and Dudley Wallick, Clifton, N.J., assignors to International Patents & Development Corporation
Filed Aug. 30, 1968, Ser. No. 756,521
Int. Cl. A61m 5/00; A61j 1/00
U.S. Cl. 128—214 **9 Claims**



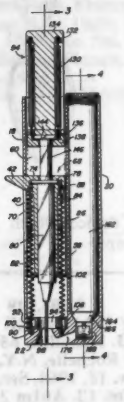
An intravenous injection arrangement or apparatus in which the fluid to be injected is contained under pressure within a bottle. The fluid is forced from the bottle into an evacuated chamber, by way of a needle valve. The hypodermic needle for injecting purposes communicates with the evacuated chamber through a flexible tube. The chamber is evacuated in a manner which insures that no air remains within the fluids being injected.

3,605,741
INTRAVENOUS FLOW CONTROL SYSTEM
Jordan L. Spencer, 560 Riverside Drive, New York, N.Y. 10027
Filed June 9, 1969, Ser. No. 831,351
Int. Cl. A61m 5/00
U.S. Cl. 128—214 **13 Claims**



The present invention deals with an improved method and apparatus for measuring flow in an intravenous feeding system or other fluid flow system characterized by its low flow rate. The invention utilizes the transit time or oscillatory frequency of a ball or float which moves along the direction of fluid flow and is returned to its original position by actuating a magnetic return system as it breaks a light beam or other sensing system. The cycle is repeated, with the transit time or oscillatory frequency being related to rate of fluid flow, and thus serving to indicate same for control purposes. The flow tube-ball measuring unit preferably takes the form of a disposable and preferably sterile insert into an intravenous feeding system.

3,605,742
PAINLESS INJECTION DEVICE
Robert C. Tibbs, Cleveland, Miss., assignor of fractional part interest to Eugene E. Tibbs, Cleveland, Miss.
Filed Feb. 3, 1970, Ser. No. 8,366
Int. Cl. A61m 5/20
U.S. Cl. 128—218F 14 Claims

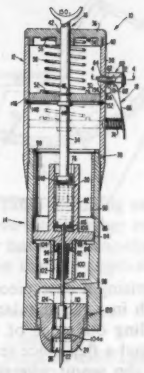


An injecting device for a hypodermic syringe rapidly projects the syringe needle through a surface engaging end of a housing adapted to fit within the hand. An injector bar actuates the syringe plunger after the needle has penetrated the skin and tissues. Prior desensitizing of the skin by discharge of coolant from a pressurized container in the housing, may be utilized to reduce pain and irritation. The needle projecting mechanism may also be conditioned to produce aspiration for detecting whether the needle has penetrated a blood vessel, before medication is injected by the plunger.

3,605,743
HYPODERMIC SYRINGE
Raul Olvera Arce, Cordobanes 25, Mexico City 19, D.F. Mexico
Filed Oct. 14, 1968, Ser. No. 767,271
Int. Cl. A61m 5/00
U.S. Cl. 128—218F 4 Claims

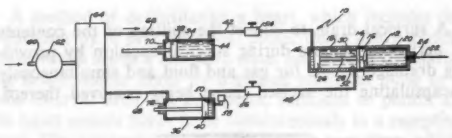
A spring loaded hypodermic syringe mounted within a cylinder and instantaneously releasable by manipulation of a release member for entrance of the hypodermic needle portion to a predetermined depth by use of an adjustable preset needle means preparatory to normal manipulation of the syringe.

3,605,744
INJECTION APPARATUS AND METHOD OF INJECTING
Edward M. Dwyer, 53 Church St., Plymouth, Pa. 18651
Filed Apr. 22, 1969, Ser. No. 818,237
Int. Cl. A61m 5/20
U.S. Cl. 128—218F 15 Claims



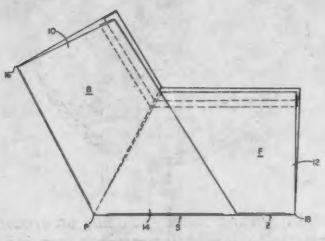
An injection apparatus useable for both pre-injection and completing the injection of an anesthetic, and a method of pre-injecting and completing the injection. Pre-injection is accomplished at a high pressure and thereafter the injection is completed at a lower pressure under manual control. Both injection stages utilize a needle. The apparatus also includes a spring loaded plunger movable to inject anesthetic through the needle at a high pressure and further movable for manual injection of anesthetic through the needle at the lower pressure. The needle is adjustable relative to the injector housing for deeper tissue penetration during the low pressure injection.

3,605,745
DENTAL INJECTION APPARATUS
Milton Hodosh, 72 Overhill Road, Providence, R.I. 02906
Filed Dec. 15, 1969, Ser. No. 884,962
Int. Cl. A61m 5/20
U.S. Cl. 128—218A 5 Claims



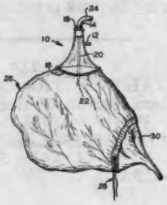
Apparatus for slowly and uniformly injecting liquid anesthesia and the like comprising a syringe having a compressible cartridge therein containing the anesthesia, and piston and cylinder means for effecting compression of the cartridge to cause the desired dispensing of the anesthesia, said apparatus comprising a supply of a viscous fluid, such as hydraulic oil, which is forced into said cylinder through a port located on one side of the piston and is forced out of the cylinder through a port located on the opposite side of the piston, whereupon movement of the piston is cushioned by the viscous fluid.

3,605,746
DIAPERING OF INFANTS
Charles H. Schaar, Lake Zurich, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Dec. 10, 1969, Ser. No. 883,749
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **5 Claims**



A diaper comprising a base piece, which is constructed by cutting a notch in a rectangular piece of diaper material and then sealing one edge of the notch to the other to form a seam, and a flap piece secured to the base piece in the region of the seam; wherein, when the diaper is folded along its sole line of symmetry, the fold comprises two line segments which intersect in an obtuse angle.

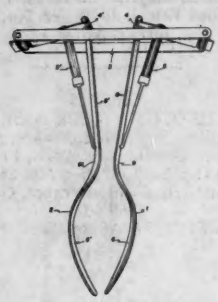
3,605,747
SURGICAL DRAIN
Fredric J. Pashkow, 3423B Maize Road, Columbus, Ohio 43224
Filed Dec. 19, 1969, Ser. No. 886,652
Int. Cl. A61b *17/00;* **A61m** *1/00*
U.S. Cl. 128—303 **9 Claims**



A surgical drain to collect the spilling of the contents of peritoneal masses during surgical excision by providing drainage means for gas and fluid and simultaneously encapsulating the excised tissue being removed thereof.

3,605,748
OBSTETRICAL FORCEPS
Hector Salinas-Benavides, Ensenada, 231, Colonia Mitras, Monterrey, Nuevo Leon, Mexico
Filed Nov. 21, 1969, Ser. No. 878,741
Claims priority, application Mexico, Apr. 29, 1969, 110,777/69
Int. Cl. A61b *17/44;* **B25b** *7/04;* **B66c** *1/62*
U.S. Cl. 128—323 **9 Claims**

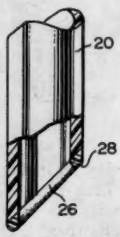
The specification discloses an improved obstetrical forceps in which a pair of limbs have scoops formed on one end and extend to a frame at the other end which joins the limbs together. The limbs are pivotally connected to the frame and each limb is formed of two parts hinged together and supported at about right angles to each other by a spring device which limits the force to be exerted on the forceps.



3,605,749
URINARY DRAINAGE APPARATUS
Henry J. Heimlich, 650 Main St., New Rochelle, N.Y. 10801
Filed Nov. 18, 1968, Ser. No. 776,591
Int. Cl. A61m *25/00*
U.S. Cl. 128—349R **9 Claims**

Catheter for insertion into patient's bladder connected to tubing which terminates at a urine collection receptacle. Tubing formed of limp material so that it normally assumes a collapsed condition. Portion of catheter may also be formed of limp material, and stiff, flexible rod extends longitudinally along catheter but is separable from it.

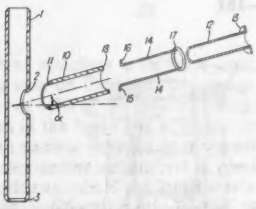
3,605,750
X-RAY TIP CATHETER
David S. Sheridan, Argyle, and Isaac S. Jackson, Greenwich, N.Y., assignors to David S. Sheridan, Argyle, N.Y.
Filed Apr. 7, 1969, Ser. No. 814,061
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **9 Claims**



Catheters of the disposable, seamless, extruded plastic type are made with distal end portions that are X-ray opaque by fusing a plastic annulus containing X-ray opaque pigment onto the preformed tube. The catheter may have one or more of such X-ray opaque outlined

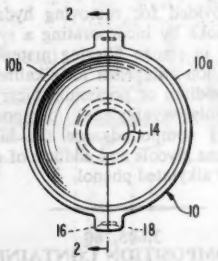
openings in the distal end portion and where a plurality are provided, their spacing may be proportioned to the size and type of the catheter. Such X-ray outline portions permit the position of the distal end portion of the catheter within a patient to be determined by X-ray methods.

3,605,751
TRACHEOTOMY TUBE ASSEMBLY
Roger Gulling, Saint-Fons, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed Oct. 10, 1969, Ser. No. 865,447
Claims priority, application France, Oct. 10, 1968, 169,502
Int. Cl. A61b *17/24*; A61m *25/00*; F16l *41/00*
U.S. Cl. 128—351 **6 Claims**



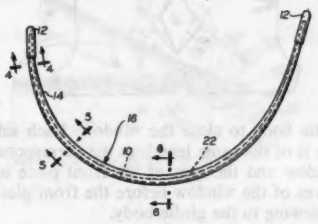
A tracheal device, for use in tracheotomy in which a main tube is inserted in the trachea. A lateral orifice therein accommodates the reduced end portion of an external lateral tube which is fitted after the tracheotomy. A clip having hooks thereon passes through the external tube and an internal tube is pushed in to force the hooks to engage on the interior of the main tube, thus holding the two tubes and the clip in place.

3,605,752
CATHETER GUARD
Robert M. Schlesinger, 650 Huntington Ave., Boston, Mass.
Filed Mar. 4, 1969, Ser. No. 804,225
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 **4 Claims**



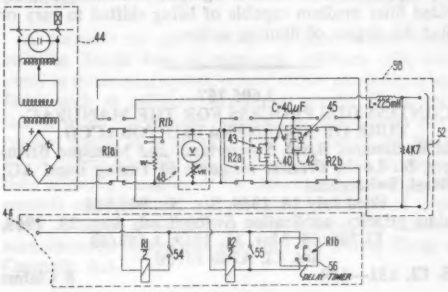
A device for retaining an in-dwelling penile catheter is formed from mating hemispherical shell segments having a bore extending through the shell for passing a catheter through it. A liquid-absorbent lining is secured to the inner surfaces of the shell and bore to snugly hold the catheter in place while applying liquid medication to the catheter-body interface. The device is in the form of a cup which is made in two mating segments which are separable from each other. A bore is formed in the cup when the segments are joined together, and the bore receives the catheter.

3,605,753
BREAST SUPPORTING FRAMES
Herbert L. Schwartz, Kew Garden Hills, N.Y., assignor to S. & S. Industries Inc., Bronx, N.Y.
Filed Apr. 3, 1970, Ser. No. 25,383
Int. Cl. A41c *1/14*
U.S. Cl. 128—476 **4 Claims**



A breast supporting frame including an arcuate shaped resilient wire and a sleeve-like member encasing the wire; said sleeve-like member having a pear-shape cross section with the bulbous portion thereof disposed along the concave edge of the wire.

3,605,754
DOUBLE PULSE HEART DEFIBRILLATOR AND METHOD OF USE
George Gustav Jaros, Johannes Petrus Gous, and Johan Samuel Loubser, Pretoria, Republic of South Africa, assignors to South African Inventions Development Corporation, Scientia, Pretoria, Transvaal Province, Republic of South Africa
Filed Sept. 25, 1968, Ser. No. 776,843
Claims priority, application Republic of South Africa, Nov. 23, 1967, 67/7,057
Int. Cl. A61n *1/36*
U.S. Cl. 128—419D **5 Claims**

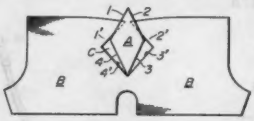


A method of defibrillating a heart, which includes depolarizing by a first electrical pulse, those heart muscle fibres which are in a receptive state, and of later depolarizing heart muscle fibres by a second electrical pulse at a time interval after the first pulse, sufficient to permit all the heart muscle fibres to be simultaneously in a receptive state. The apparatus has energy storage capacitors which are charged from a variable power supply via a capacitor charge and impulse discharge inverter and discharged when desired under the control of a stored energy monitor via damping and safety circuits to energize electrodes.

3,605,755
PANTY GIRDLE AND METHOD OF MAKING
Echiko Kugitani, Kyoto, Japan, assignor to Wacoal, Inc., Kyoto, Japan
Filed Mar. 5, 1969, Ser. No. 804,462
Int. Cl. A41c *1/04*
U.S. Cl. 128—528 **9 Claims**

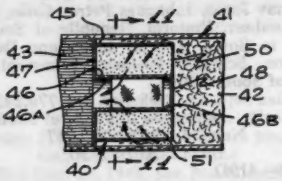
A girdle or a panty girdle comprises a girdle body made of a material stretchable in two directions and formed on

its front side corresponding to the abdominal region of a wearer with a window of a diamond, honeycomb cell, elliptical or similarly curved shape, and a front piece made of the same material as the girdle body and similar in shape to the window, is connected by sewing



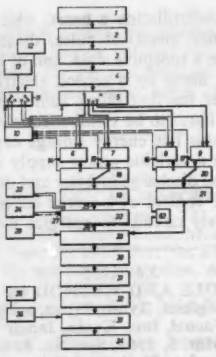
to the girdle body to close the window. Each side of the front piece is of the same length as the corresponding side of the window and the area of the front piece is smaller than the area of the window before the front piece is connected by sewing to the girdle body.

3,605,756
ADJUSTABLE FILTER CIGARETTE
Herman V. D. Stewart, 1721 Royal Blvd., Glendale, Calif. 91207
Filed Oct. 9, 1967, Ser. No. 673,631
Int. Cl. A24d *1/04*
U.S. Cl. 131—10.5 **3 Claims**



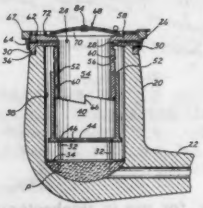
The application discloses a cigarette containing a finely divided filter medium capable of being shifted to vary or adjust the degree of filtering action.

3,605,757
CONTINUOUS PROCESS FOR THE MANUFACTURE OF REGENERATED TOBACCO
Paul Buchmann, Basel, Switzerland, and Monique Beringer, St. Louis, France, assignors to Tamag Basel AG, Basel, Switzerland
Filed July 30, 1969, Ser. No. 846,038
Claims priority, application Switzerland, Aug. 23, 1968, 12,704/68; Mar. 11, 1969, 3,663/69
Int. Cl. A24b *13/00*
U.S. Cl. 131—140 **8 Claims**



In order to manufacture regenerated tobacco, a mash is formed from reduced (pulverized) basic tobacco constituents. To this end, the reduced tobacco is admixed with a liquid to form a slurry which is forced through a glass grain body which is stirred at the same time. This homogenizes the slurry to form a mash. The glass grains are worn during the process. The glass grains which have been worn down to an unusable size are discharged from the body along with the tobacco mash. New glass grains are used to replenish the glass grain body continuously and thus make good the loss to the glass grain body caused by wear and removal of the unusable glass grains.

3,605,758
TOBACCO PIPE WITH MAGAZINE
Jay K. Patterson, P.O. Box 454, Laramie, Wyo. 82070
Filed Apr. 21, 1970, Ser. No. 30,384
Int. Cl. A24f *5/06*
U.S. Cl. 131—181 **9 Claims**



A tobacco pipe having a tobacco magazine operable to progressively advance unburned tobacco upwardly to a combustion zone located adjacent the upper end of the pipe bowl. The upper end of the bowl is normally closed by a draft control assembly which controls the distribution of air through the combustion zone to achieve even combustion and to provide a self-tamping action to the ashes and coal as fresh tobacco is fed to the combustion zone.

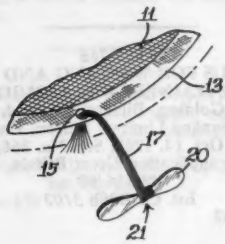
3,605,759
FILTER FOR TOBACCO SMOKE
William F. Owens, Jr., Pisgah Forest, and Bruce G. Woodard, East Flat Rock, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.
No Drawing. Filed Dec. 22, 1969, Ser. No. 887,306
Int. Cl. A24b *15/02;* **A24d** *1/06*
U.S. Cl. 131—265 **9 Claims**

A filter is provided for removing hydrogen cyanide from tobacco smoke by incorporating a synergistic mixture of additives in smoke filtering material. The novel additive combination comprises an alkaline metal bicarbonate, such as sodium or potassium bicarbonate, and a water soluble poly(oxyalkylene) compound. Suitable poly(oxyalkylene) compounds are the high molecular weight polyethylene glycols and adducts of ethylene oxide and an alcohol or alkylated phenol.

3,605,760
TOBACCO COMPOSITION CONTAINING 3,5-DISUBSTITUTED-2-HYDROXYACETOPHENONES
Andrew G. Kallianos, Albert H. Warfield, and Melvyn I. Simpson, Durham, N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.
No Drawing. Filed Sept. 11, 1969, Ser. No. 857,211
Int. Cl. A24b *3/12, 15/04*
U.S. Cl. 131—17 **11 Claims**

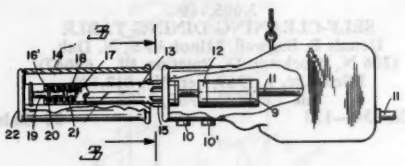
3,5 - disubstituted - 2 - hydroxyacetophenones, such as 3,5 - diisopropyl - 2 - hydroxyacetophenone, are prepared by the base-catalyzed reaction of a 2,4-disubstituted-2-butenal, e.g., 2,4 - diisopropyl - 2 - butenal, with an ester of acetoacetic acid. The thus-produced substituted 2-hydroxyacetophenones are useful as tobacco flavorants.

3,605,761
METHOD OF FASTENING HAIRPIECE
Ronald A. Magro, 538 Street Road,
South Hampton, Pa. 17330
Filed Jan. 13, 1970, Ser. No. 2,637
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 10 Claims



A method of attaching a hairpiece with a base cap to cover a bald area on the head of a person includes passing a number of tufts of the person's own hair through peripheral holes in the base. The holes are spaced about the bald area. An anchor member is permanently secured to each tuft either before or after it is passed through the cap. The anchor members are located at a distance from the scalp sufficient to permit loosening of the hairpiece for cleaning the scalp. The original registration of the base on the bald area is retained upon re-tightening of the hairpiece. The hair between the anchor member and the scalp is then taken up until the cap is tightened to the scalp; and the anchor member is then releasably secured to the cap to hold it in place.

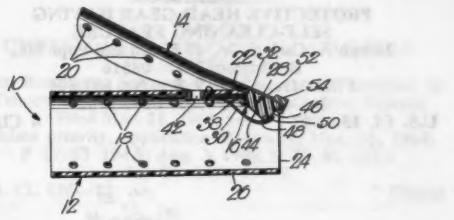
3,605,762
ELECTRIC HAIR ROLLER
Arthur R. A. Fromman, Phoenix, Ariz., assignor of fractional part interest to Dennis L. Taelman, Phoenix, Ariz.
Filed Aug. 17, 1970, Ser. No. 64,497
Int. Cl. A45d *2/12*
U.S. Cl. 132—9 7 Claims



Apparatus for curling hair including a power driven roller which makes and breaks connection with an actuating means by hand pressure of an operator.

3,605,763
HAIR CURLER
Ralph M. Fusco, 299 Johnson St.,
Naugatuck, Conn. 06770
Filed July 29, 1970, Ser. No. 59,236
Int. Cl. A45d *2/26*
U.S. Cl. 132—41A 9 Claims

A tubular hair curler body is provided with an end notch for reception of a depending end lug on a clamp which in closed position on the body is in substantial form-fit therewith, with the lug also having side shoulders engaging the inner body periphery in closed clamp position, so that removal of the clamp from the body is only by way of endwise retraction of the lug from the notch

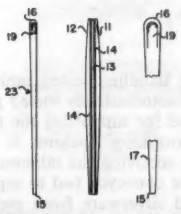


which, however, is normally prevented by a spring in the body which yieldingly holds the lug in the notch and normally closes the clamp on the body, with the notch, lug and spring forming a releasable hinge connection between the clamp and body.

3,605,764
EYELINER, APPLICATOR AND CASING
Joseph R. Ehrlich, New York, N.Y., assignor to Melvin J. Davidson and Bernard M. Zitomer, both of New York, N.Y.
Filed June 6, 1969, Ser. No. 831,069
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 10 Claims

A cosmetic for use as an eyelid liner. A low viscosity coloring liquid, free of pigments, solvents, oils, waxes, gums or thickening agents, is held within parallelly oriented fibers such as cellulose acetate or acrylic fibers, etc. A felt or nylon tip pressed between the fibers doles out the colored liquid as required during application on the eyelid. A casing encloses the impregnated fibers, at the same time allowing handling of the device. The coloring liquid consists essentially of a concentrated solution of urea in water, with the addition of a water-soluble dye substance, manufactured in compliance with the Food, Drug and Cosmetic Act.

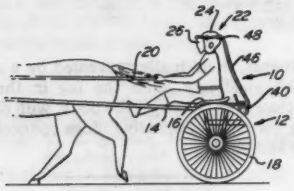
3,605,765
INTERPROXIMAL DENTAL STIMULATOR
Clarence P. Canby, 122 Medford Drive,
San Antonio, Tex. 78209
Filed Oct. 16, 1969, Ser. No. 866,975
Int. Cl. A61c *15/00*
U.S. Cl. 132—93 6 Claims



A pick type, interproximal dental stimulator having a wood exterior surface bonded to and surrounding a fiber

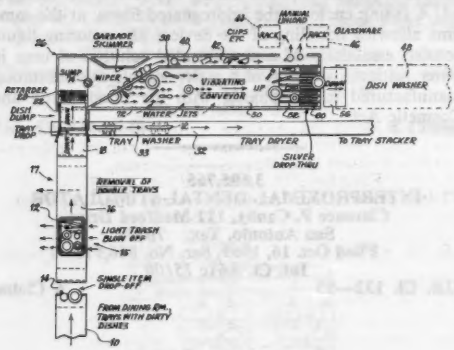
filament core the size, external contour, flexibility and resulting tensile strength particularly adapting the instrument to removing dental plaque stimulating gingival tissue and promoting oral health.

3,605,766
PROTECTIVE HEAD GEAR HAVING SELF-CLEANING FEATURE
Joseph A. Carlani, Jr., 47 E. 5th and Pope Sts., Burlington, N.J. 08016
Filed Mar. 17, 1969, Ser. No. 807,694
Int. Cl. A61f 9/02; B08b 3/02
U.S. Cl. 134—47 **4 Claims**



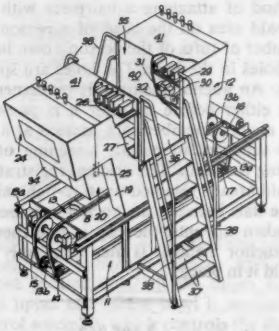
Protective head gear is disclosed, comprising a head receiving member and a face shield, and fluid distribution means associated with the face shield for applying a cleaning fluid to the shield. In one form of the invention, a fluid reservoir is provided on a wheeled vehicle, and a wheel-driven pump provided to convey cleaning fluid from the reservoir to the distribution means.

3,605,767
VIBRATING SORTER FOR SOILED TABLEWARE
Ralph Ettlinger, Jr., Highland Park, and Walter M. Schneider, Chicago, Ill., assignors to Avant Industries, Inc., Wheeling, Ill.
Filed May 28, 1969, Ser. No. 828,510
Int. Cl. B08b 3/04
U.S. Cl. 134—62 **15 Claims**



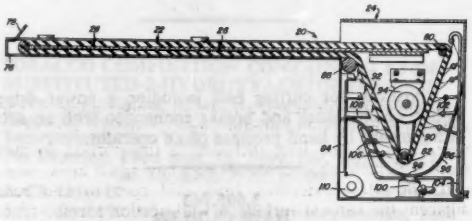
A construction for handling soiled tableware so that the tableware can be automatically sorted prior to placement into holders used for supporting the tableware as it passes through a dishwashing machine. A vibrating conveyor is provided for receiving the tableware, and a barrier extends across the conveyor bed to separate flatware comprising plates and silverware from pieces of greater height such as cups and glasses. The separated tableware is delivered along separate paths to the end of the vibrating bed for placement in appropriate racks or other dishwashing equipment holding means. The flatware is divided by providing slots in a corrugated section of the bed so that the silverware is collected apart from plates. Means are also provided for separating soiled dishes from cafeteria trays where the dishes are initially delivered on such trays.

3,605,768
APPARATUS FOR WASHING AND FILLING CONTAINERS FOR LIQUIDS
Cyril George Golding, Bilston, England, assignors to GKN Sankey Limited, Bilston, England
Filed Oct. 14, 1969, Ser. No. 866,299
Claims priority, application Great Britain, Oct. 14, 1968, 48,634/68
Int. Cl. B08b 3/02
U.S. Cl. 134—62 **10 Claims**



A combined washing and racking machine for beer kegs comprises a conveyor for conveying a succession of kegs past a washing station and then past a racking station at spaced positions along the conveyor. An upper unit extends over the washing station forming a tunnel through which the kegs pass. Pneumatically operated turnover arms are mounted on the tunnel walls and arranged to grip a keg at the washing station and invert it before passing on to the racking station.

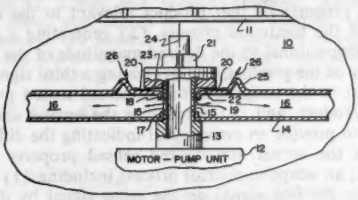
3,605,769
SELF-CLEANING DINING TABLE
Dennis P. Bagwell, Minot AFB, N. Dak. (206 N. Brockway 11, Palatine, Ill. 60067)
Filed Apr. 1, 1969, Ser. No. 812,180
Int. Cl. B08b 3/02, 1/02
U.S. Cl. 134—115 **20 Claims**



An endless flexible belt mounted on a table defining panel for travel thereacross through an end located cleaning cabinet. A length of the belt equal to the length of

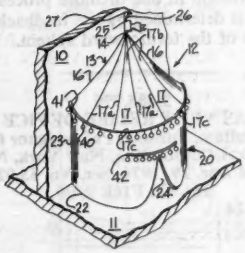
the support panel is provided with at least one and preferably multiple place settings, including integral food receptacles and removably mounted utensils. This portion of the belt travels through the cleaning cabinet in an inverted position and along a triangular path during which it is subjected to cleaning and drying operations, after which it is stored beneath the support panel until ready for use.

3,605,770
DISHWASHER APPARATUS
William F. Robandt II, St. Joseph, and Raymond W. Spiegel, Stevensville, Mich., assignors to Whirlpool Corporation
Filed Apr. 15, 1970, Ser. No. 28,648
Int. Cl. B08b *3/02*
U.S. Cl. 134—179 **9 Claims**



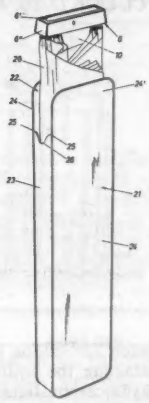
A dishwasher that includes a liquid conduit and a rotatable spray arm and an article holding rack spaced from the spray arm in which a portion of the liquid that is under pressure within the spray arm is permitted to escape to the outside of the arm, and in which intercepting and projecting members are provided for directing this escaping liquid first along the outer surface of the spray arm and then toward the adjacent rack and articles such as dishes therein.

3,605,771
TENT STRUCTURE
Gay C. Fox, 307 Tomahawk Ave., and Mary E. Droppers, Box 1196, both of Black Mountain, N.C. 28711
Filed Apr. 1, 1969, Ser. No. 812,201
Int. Cl. A45f *1/00*
U.S. Cl. 135—1 **2 Claims**



A tent structure adapted to be suspended adjacent and supported by a substantially vertical surface such as a wall, door or the like, including a top portion formed from a flexible sheet material and having an apex, base, and side edges extending from said apex to said base adjacent the vertical surface, a wall portion formed from a flexible sheet material and connected to the base of said top portion and having side edges adjacent the vertical surface, means connected to the apex suspending the tent structure adjacent the vertical surface, and support means mounted along the connection between said top and wall portions and having terminal ends bearing against the vertical surface and a body portion extending outwardly therefrom supporting the top and wall portions in an extended position, whereby the top and the wall portions with the vertical surface form an enclosure.

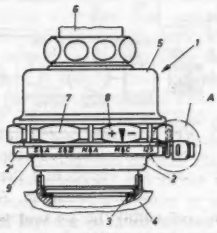
3,605,772
UMBRELLA SHEATH FOR FOLDABLE-FLAT UMBRELLAS
Fritz Bremshey, Solingen-Ohligs, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Filed Mar. 21, 1969, Ser. No. 810,443
Claims priority, application Germany, Mar. 30, 1968, P 17 57 104.9; Aug. 3, 1968, P 17 82 245.6
Int. Cl. A45b *25/18*
U.S. Cl. 135—33 **7 Claims**



A collapsible umbrella which when collapsed is flattened in cross section and has a generally rectangular or oval outline. The handle is of corresponding rectangular cross section and has dome rib receiving recesses in opposed lateral portions of the handle.

The sheath for stowing the collapsed flat umbrella is of rectangular cross section and has stiffened lengthwise side walls, and shortened widthwise side walls.

3,605,773
GAS FLOW REGULATOR
Helmut Schmidt auf Altenstadt, Remscheid-Reinshagen, and Ernst Sohnchen, Huckeswagen, Germany, assignors to Joh. Vaillant KG., Remscheid, Germany
Filed June 22, 1970, Ser. No. 48,265
Claims priority, application Germany, June 24, 1969, P 19 31 898.0
Int. Cl. F17d *1/02, 3/00*
U.S. Cl. 137—1 **7 Claims**



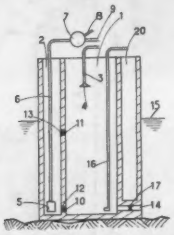
A gas flow regulator has a ring rotatable with respect to the body for adjusting the performance of the regulator

as required by the conditions. A pointer is mounted on the ring in juxtaposition to scale indicia on the body to indicate the setting of the adjustment ring. These are applied after the regulator is installed so that they will be on the front of the installed regulator. A sealed locking clamp prevents rotation of the ring.

3,605,774
MARITIME APPARATUS UTILIZABLE AS A HYDROCARBON RESERVOIR

Pierre Launay, Versailles, and Tran Dinh Phat, Paris, France, assignors to Compagnie Industrielle de Travaux and Compagnie Francaise des Petroles, both of Paris, and Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed July 20, 1970, Ser. No. 56,289
Claims priority, application France, July 30, 1969, 6,926,062
Int. Cl. E02b *17/00, 1/00*
U.S. Cl. 137—1 **12 Claims**

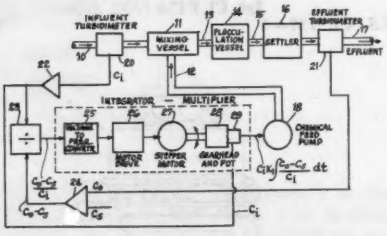


A marine installation for storing hydrocarbon liquids has a reservoir containing the hydrocarbon liquid and water beneath the hydrocarbon liquid. As the hydrocarbon liquid enters the reservoir water is removed. When the hydrocarbon liquid is removed water is added to maintain sufficient ballast in the installation to keep the installation immersed and in place.

3,605,775
METHOD TO CONTROL DOSAGE OF ADDITIVE INTO TREATMENT PROCESS AND AUTOMATIC DEVICE THEREFOR

Carl J. Zaander, Clarendon Hills, Veljko Milenkovic, Glencoe, and Bernard A. Johnson, Deerfield, Ill., assignors to General American Transportation Corporation

Filed Nov. 18, 1969, Ser. No. 877,732
Int. Cl. E03b *1/00;* **G05d** *11/00*
U.S. Cl. 137—3 **23 Claims**



A method for controlling, by a novel feedforward-feedback adaptive system, a continuous process of treating a fluid, containing an ingredient, that includes incorporating a dosage of additive in the flowing fluid so as to change the ingredient. During the operation of the process, without the use of the control method, there can be unpredictable variations affecting the efficiency of the treatment so as to require correction of the dosage of additive to an unpredictable extent. A device for this system provides for automatic control of dosage of the additive. In the process there is a nonlinear relationship between the amount of additive and the degree of treatment. This relationship can be expressed as a monotonic curve within the range of concentration of the ingredient in the fluid and the range of dosage required for the desired extent of treatment.

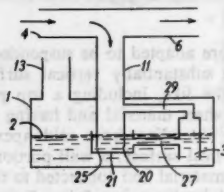
The control method comprises: a feedforward control process including (1) monitoring the flowing fluid to sense a property of the fluid relevant to the treatment of the fluid by the additive, and (2) generating a first signal proportional to the magnitude of the sensed property of the fluid to be treated; a feedback control process including (1) monitoring a product of the treatment process to sense a property of that product relevant to the desired result of the treatment process, (2) generating a second signal proportional to the desired magnitude of the sensed property of the product, (3) generating a third signal proportional to the magnitude of the actual sensed property of the product, and (4) comparing the second and third signals to provide an error signal indicating the difference between the actual and desired sensed property of the product; an adaptive control process including (1) superimposing the first signal on the error signal by dividing the latter by the former to provide a fourth signal, (2) integrating the fourth signal over a long period of time to provide a fifth signal, and (3) multiplying the first signal by the fifth signal to obtain a sixth signal that includes the variable gain for the first signal by the extent of the fifth signal; and using the sixth signal to adjust the dosage of additive into the fluid.

The device for automatically controlling the dosage of additive performs the three basic control functions described above for the process. Thus the part of the device that provides a signal representing a comparison of actual and desired property of a product of the treatment is the feedback system that is used to adjust dosage with the adjustment time being made through an integrator to reduce the steady state error to zero. The signal proportional to the magnitude of the property of the fluid to be treated is the feedforward signal that provides essentially instantaneous corrective response while the other system is very slow. The control of the feedforward system to change with variation in one or more process conditions, e.g., efficiency, is determined by the feedback system that adjusts the gain of the feedforward system.

3,605,776
GAS VENT RELIEF DEVICE

James J. Fullam, Furlong, Pa., assignor to Allied Chemical Corporation, New York, N.Y.

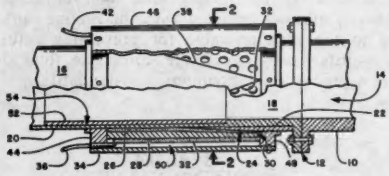
Filed Apr. 29, 1970, Ser. No. 33,022
Int. Cl. F16k *9/00*
U.S. Cl. 137—14 **16 Claims**



A gas pressure relief device is provided which is based on a liquid seal and comprises a housing having inlet and

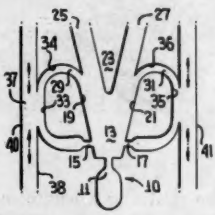
outlet means, a liquid level within said housing which seals the open end of the inlet means under normal operating pressures, said seal capable of being blown or ruptured under abnormal pressure conditions to permit passage of gas through the inlet means into the housing and escape through the outlet means; the structure of said inlet means at its open end in the housing being designed so that the liquid seal will not reestablish itself when blown until the pressure in the inlet means has been returned to a predetermined normal operating level and will not permit reverse gas flow even when the system which the device serves is subjected to moderate negative pressure. This invention finds particular application as a safety device for control of the pressure of hydrogen gas evolved in the manufacture of chlorine in electrolytic cells.

3,605,777
CLOSURE MECHANISM
George G. Curry and John C. Dresser, Albuquerque, N. Mex., and James A. Moeller, Phoenix, Ariz., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed May 11, 1970, Ser. No. 36,035
Int. Cl. F16k *7/04*
U.S. Cl. 137—67 **10 Claims**



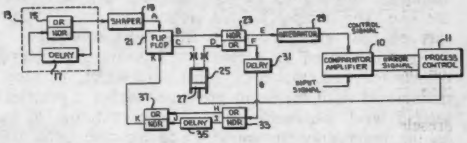
Apparatus for rapidly closing a conduit by pinching off with an explosive utilizing a tapered explosive collar about a tapering wall with a tamper for directing explosive energy against the tapering wall, and simultaneously igniting the explosive collar about its circumference.

3,605,778
VARIABLE DELAY LINE OSCILLATOR
Eric E. Metzger, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.
Filed Mar. 4, 1969, Ser. No. 804,086
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **15 Claims**



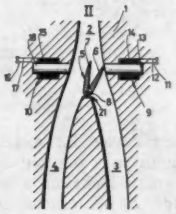
The frequency of a negative feedback type fluidic oscillator is rendered variable by introducing control fluid flow to either aid or oppose the feedback flow. The control fluid flows adjacent, about or within the feedback fluid in an enlarged section of the feedback passage, and may have a variable flow rate which frequency-modulates the oscillator output signal. The oscillator may be employed as a flow sensor when the control fluid is supplied from the flow being monitored. Alternatively, if the enlarged section of the feedback passage is curved about a predetermined axis, rotation of the system about that axis introduces control flow variations which vary the oscillator frequency as a function of angular acceleration of the system about that axis.

3,605,779
FLUIDIC CONTROL CIRCUIT
Peter Bauer, Germantown, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.
Filed Mar. 14, 1969, Ser. No. 807,374
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 **12 Claims**



Fluidic process control is achieved by controllably delaying a fluid signal in response to variations in a process parameter. In a preferred embodiment the controllable delay effects duty cycle variations in a constant frequency alternating fluid signal. Integration of the variable duty cycle signal provides an analog fluid signal as a function of the variable process parameter.

3,605,780
ELECTROMECHANICAL FLUIDIC TRANSDUCER
Walter Kranz, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn, near Munich, Germany
Filed Sept. 17, 1969, Ser. No. 858,656
Claims priority, application Germany, Sept. 21, 1968, P 17 74 859.3
Int. Cl. F15c *3/08*
U.S. Cl. 137—81.5 **8 Claims**

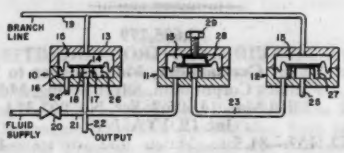


An electromechanical fluidic transducer has a flow feed line communicating with two flow outputs. Two control signal responsive electromagnetic devices are operable to select the flow output, each controlling flow relative to a respective output. A single flow switching element is movable, under the influence of fluid flow, into flow blocking relation in a selected one of the flow outputs, and the switching element is lockable in its blocking position by the associated electromagnetic device. The flow switching element is a forked element, and either may be pivoted at the fork between the two outputs or may be flexible, in the form of a leaf spring. Adjustment canals or ducts communicate with the flow feed or supply line from opposite sides to compensate for asymmetry of the flow control element.

3,605,781
PNEUMATIC RELAY

Frederick D. Joesting, Park Ridge, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 16, 1970, Ser. No. 55,320
Int. Cl. G05d *23/00, 11/00*
U.S. Cl. 137—82 10 Claims

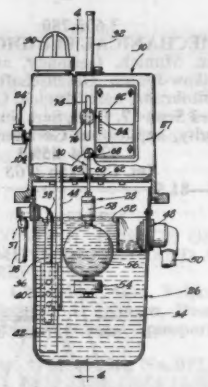


A pneumatic relay utilizing diaphragm logic for providing an output pressure to a fresh air damper motor or the like. The damper is held closed until the input pressure to the relay reaches a first level whereupon the damper is opened to a preselected position admitting a preselected percentage of fresh air, which position is maintained until the input pressure reaches a preselected second level, whereafter the damper continues to open as the input pressure continues to increase until 100% fresh air is admitted.

3,605,782
LIQUID MIXING DEVICE

Raymond Hollis, Park Ridge, and Frank X. Barr, Buffalo Grove, Ill., assignors to Graymills Corporation, Chicago, Ill.

Filed July 14, 1969, Ser. No. 841,243
Int. Cl. G05d *11/00;* B41l *27/00*
U.S. Cl. 137—91 6 Claims



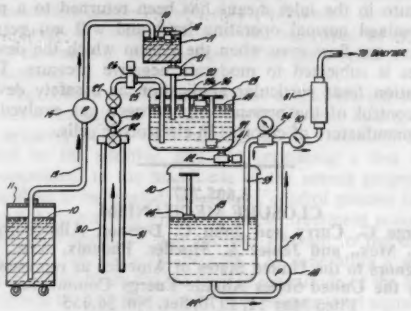
A liquid mixing device for mixing and maintaining two or more liquids to a selected specific gravity of a mixture of the liquids including a tank for holding the mixture of liquids. A hydrometer is positioned in the tank, and the hydrometer is connected to a control device. The control device is in turn connected to a valve which controls the flow of one of the liquids into the tank holding the mixture of liquids, thereby regulating the specific gravity of the mixture in the tank by the addition of one of the liquids.

3,605,783
FLUID MIXING SYSTEM

Edwin A. Pecker and Harve M. Hanish, Los Angeles, Calif., assignors to Bio/Systems, Inc., Santa Monica, Calif.

Filed Mar. 17, 1966, Ser. No. 536,194
Int. Cl. G05d *11/13*
U.S. Cl. 137—93 9 Claims

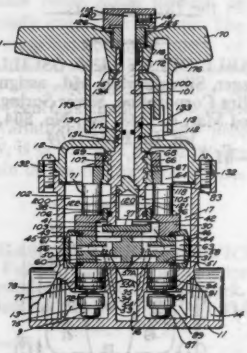
A fluid mixing system for mixing two fluids and delivering the composite fluid to a device. The system includes a mixing tank for receiving the components of the composite fluid and a supply tank for storing the mixed fluid. The supply tank has a capacity substantially larger than the capacity of the mixing tank and has an outlet providing a continuous flow of the composite fluid to the device. A transfer valve is located between the mixing tank and supply tank and is actuable to empty the entire contents of the mixing tank into the supply tank. A testing means associated with the mixing tank is coupled to the transfer valve for preventing actuation of the transfer valve when the composite fluid does not meet a predetermined composition standard.



3,605,784
MIXING VALVE

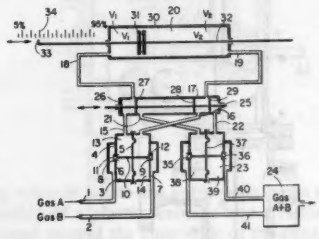
Lawrence Everton Bowman, Warwick, R.I., assignor to Leonard Valve Company, Cranston, R.I.

Filed Dec. 23, 1969, Ser. No. 887,550
Int. Cl. G05d *11/00*
U.S. Cl. 137—100 3 Claims



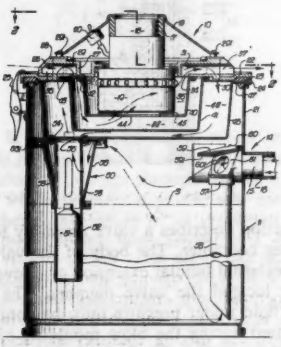
This invention relates to a bathroom shower hot and cold water mixing valve which incorporates three structural features. One feature is an independently operated volume or flow control valve for the mixed water. The second feature is a valve opening and valve closing independently operated temperature regulating sleeve. The third feature is an equalizing valve for maintaining the mixed water in the mixing chamber at the pre-selected temperature determined by the temperature regulating sleeve regardless of the variation in pressure of the respective, hot and/or cold water supply.

3,605,785
APPARATUS FOR MIXING GASES IN A PREDETERMINED RATIO PARTICULARLY FOR RESPIRATORY AND MEDICAL PURPOSES
Gunter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Germany
Filed June 6, 1969, Ser. No. 831,095
Claims priority, application Germany, June 15, 1968, P 17 57 801.7
Int. Cl. G05d *11/02*
U.S. Cl. 137—101 **22 Claims**



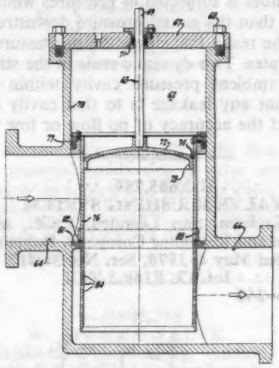
Two gases to be mixed are introduced, at equal pressures, into respective chambers whose volumes have the desired mixture ratio. The gases continue to be introduced into the respective chambers until the pressure in the chambers attains a desired value, after which flow of gases into the chambers is interrupted and flow of gases from the chambers is initiated. As the gases flow from the chambers, they are mixed to form the gas mixture. A pressure reducer is connected to the two gas inflow lines to equalize the two gas pressures. A shut-off valve is operatively associated with each inflow line. between the pressure reducer and a respective chamber. A shut-off valve also controls the outflow of gas to a further pressure equalizing pressure reducer valve whose output is connected to a gas mixing tank or the like. In a modification, the pressure reducing inflow valve and the shut-off valves are combined into a single unit. Preferably, means are provided to assure maintenance of equal pressure in the two chambers.

3,605,786
EVACUATOR
Edwin J. Machin, Jr., Roslindale, Mass., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed Sept. 10, 1969, Ser. No. 856,551
Int. Cl. A47l *5/14, 7/00*
U.S. Cl. 137—205 **15 Claims**



A tank type evacuator useable for such purposes as suction removal of liquids from surfaces with liquid accumulation in a receptacle, obviates the usual liquid dumping manipulations and other requirements by alternately evacuating the receptacle atmosphere to induce wet inflow as from a conduit connectible to an opening leading from the receptacle, and pressurizing the receptacle to expel liquid through the same opening, evacuation and pressurizing of the receptacle requiring but a single blower unit operating in conjunction with air flow control valving associated with the evacuator cover and receptacle sections.

3,605,787
POLYJET VALVE
Ralph J. Krogfoss, San Mateo, and Robert W. Dixon, Concord, Calif., assignors to Chas. M. Bailey Co., Inc.
Filed Dec. 4, 1969, Ser. No. 882,098
Int. Cl. F16k *1/06*
U.S. Cl. 137—219 **7 Claims**



A polyjet valve for throttling hydraulic flow includes a housing having a liquid inlet and a liquid outlet. A tube of circular cylindrical form is disposed within the housing and at one end is interiorly connected to the outlet. The other end of the tube is closed. The tube is pierced by an exceptionally large number of holes. The relationship of these holes is determined by the formulas:

$$D_H = \frac{\text{from } 0.2 \text{ to } 0.4 I D_T}{12}$$

wherein D_H is the diameter in inches of a typical hole and ID_T is the diameter of the tube in inches and

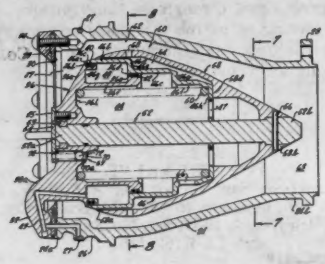
$$H_S = \text{from } 2.0 \text{ to } 3.5 D_H$$

wherein H_S is the center to center distance of adjacent holes. The tube wall thickness is between 1.0 and 2.0 times the hole minimum diameter. The holes in the aggregate have a flow area approximately equal to the flow area through the tube. A solid sleeve in the housing and surrounding the tube on the high pressure side is relatively movable along the tube by means operable from outside the housing.

3,605,788
FUELING PRESSURE REGULATOR
Albert William Brown, Newport Beach, Calif., assignor to The J. C. Carter Company, Costa Mesa, Calif.
Filed Mar. 9, 1970, Ser. No. 17,434
Int. Cl. G05d *7/01*
U.S. Cl. 137—220 **17 Claims**

A piston-like valve member is slidably mounted on a support centrally positioned within a tubular housing at the end of a fuel hose to control fuel flow through an annular path around the valve member. A fixed shroud spaced from the housing slidably receives the valve member, and sensing holes within the shroud permit fluid

pressure in the flow path to enter the shroud and react against a downstream facing working surface on the valve member. The sensing holes are placed along a restricted throat in the flow path so that at high flow rate settings



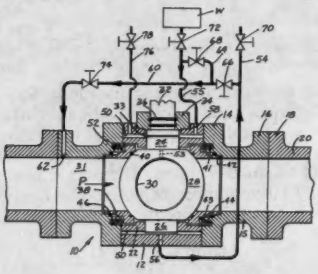
the valve member is subjected to pressures which are substantially less than the actual pressure downstream of the throat, with the result that downstream pressure increases at high flow rates. Two dynamic seals in the structure are adjacent an ambient pressure cavity within the valve member so that any leakage is to that cavity and hence does not affect the accuracy of no flow or low flow rates.

3,605,789

VALVE FLUSHING SYSTEM

Donald E. Graham, San Leandro, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed May 4, 1970, Ser. No. 34,417
Int. Cl. F16k 5/08
U.S. Cl. 137—240 **10 Claims**



A valve flushing system including a pair of flush lines connected to the top and bottom, respectively of a ball valve body. A discharge line is connected between one of the lines and the main upstream line, and a reversing line is connected between the other line and the discharge line. A valve is situated in each of the reversing and discharge lines so that fluid under pressure higher than that in the main upstream line may be forced through one of the lines, through the ball valve and out the other line to the discharge line. If the flushing is done when the valve is closed, the seat rings seal against the ball irrespectively of the direction of pressure differential so that the flushing fluid is confined between them.

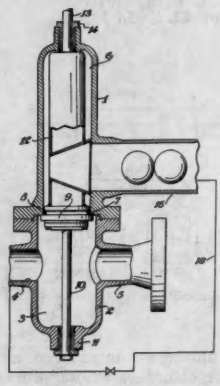
3,605,790

SPHERE LAUNCHERS

Keith Ellis Hunter, North Anston, near Sheffield, England, assignor to General Descaling Company Limited, Worksop, Nottinghamshire, England

Filed Nov. 10, 1969, Ser. No. 875,105
Claims priority, application Great Britain, Nov. 12, 1968, 53,590/68
Int. Cl. F17d 3/02
U.S. Cl. 137—268 **4 Claims**

A pipeline sphere launcher or receiver is described in which a launching or receiving carriage is movable in an elongated chamber transverse to the pipe into which a sphere is to be launched between a first position in which it receives or discharges a sphere from or to a radially extending chamber, and a second position in which the sphere is launched into or received from the pipeline by means of the flow therethrough, the carriage being supported by stems passing through glands in the ends of the elongated chamber and supporting a valve member which closes off the carriage and the radially extending chamber from the pipeline when the carriage is in its first position.

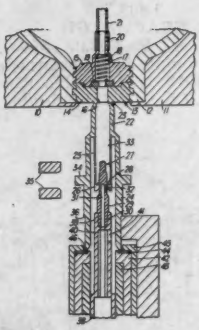


3,605,791

VALVE ASSEMBLY FOR AND METHOD OF FITTING PRESSURIZED SPRAYING CONTAINERS

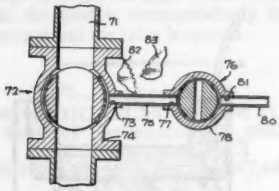
Yves Le Troadec, Mont-Saint-Aignan, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Apr. 21, 1969, Ser. No. 817,818
Claims priority, application France, July 15, 1968, 159,238
Int. Cl. B65b 3/04
U.S. Cl. 137—316 **6 Claims**



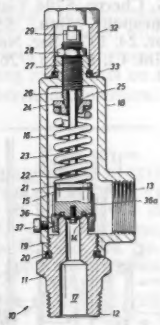
The specification describes a valve assembly for a pressurized spraying container. The body of the valve is provided with an external tubular extension or sleeve in which is temporarily located the valve member. The sleeve is used to guide fluid under pressure into the container and may also be used during the blow moulding of the container. When the container is filled, the valve member is forced through the sleeve into engagement with its valve seat, where it is retained by an already positioned spring, and the sleeve is detached.

3,605,792
VALVE WITH LEAK COLLECTOR
James V. Westbrook, La Canada, Calif., assignor to Allied Industrial Components, Lynwood, Calif.
Filed Oct. 31, 1969, Ser. No. 872,834
Int. Cl. F16k 3/26
U.S. Cl. 137—312 3 Claims



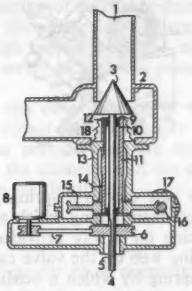
A plug valve in which the valve body has a special seal ring assembly of a plastic seal ring and a resilient backup ring disposed around the inner ends of the fluid passage in the body where such passages intersect the central valve element receiving bore, the valve element being journaled in the body beyond the bore and beyond seal rings between the valve member and body. In another form a special rectangular seal is provided on each side of the valve member to close off the fluid passages in the valve body when the valve is closed.

3,605,793
SAFETY RELIEF VALVE
John W. Kinsel, 4040 Southwest Freeway, Suite 235 Houston, Tex. 77027
Filed July 18, 1969, Ser. No. 842,947
Int. Cl. F16k 1/52, 15/02
U.S. Cl. 137—329.06 2 Claims



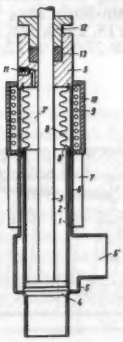
For use in a safety relief valve which incorporates a hollow body having therein a valve seat and a valve member which closes a passage through the valve seat, an improvement which includes a plastic seal carried on said valve member and adapted to be contacted against said valve seat, the valve seat being tapered at a predetermined angle with respect to the valve body and bearing against the plastic seal with a similar but differently inclined taper on the valve body immediately adjacent and behind the valve seal to provide a line of contact and closure when the plastic seal bears against the seat and a secondary but equally effective line of closure by the differently tapered valve member immediately to the rear of the seal so that wear of the seal does not effect the operation of the valve.

3,605,794
APPARATUS FOR FLOW CONTROL OF SLURRY
Hajime Seo, Katsumi Tagomori, and Toshio Okazaki, Yokohama-shi, Japan, assignors to Kurita Water Industries, Ltd.
Filed May 26, 1969, Ser. No. 827,785
Claims priority, application Japan, May 30, 1968, 43/36,969
Int. Cl. F16k 29/02
U.S. Cl. 137—331 2 Claims



A valve assembly for controlling the flow of a slurry or the like material comprising a valve seat, a closure member, which, in accordance with the valve seat, defines a valve opening, and a means for rotating the closure member so as to avoid clogging between said closure member and the valve seat.

3,605,795
SPINDLE VALVE
Gundolf Rajakovics, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Kapfenberg, Austria
Filed Jan. 28, 1969, Ser. No. 794,537
Claims priority, application Austria, Jan. 29, 1968, A 827
Int. Cl. F16k 49/00
U.S. Cl. 137—338 5 Claims

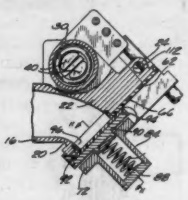


A spindle valve for preventing the escape of an operating medium and resistant to extreme temperature differentials in said medium, the valve including a housing and an axially movable spindle having a closure means at one end adjacent a valve seat in the housing. A siphon surrounds the spindle and is spaced from the closure means, and a tube connects the closure means to the siphon. A siphon chamber exists between the siphon and the housing, and a narrow annulus exists between the tube and the housing. Cooling fins are connected to the housing adjacent the narrow annulus, and a heating means surrounds the siphon chamber.

3,605,796
GATE VALVE WITH TORSION ADJUSTMENT

Edward F. Sette, Oakland, Calif., assignor to Sette Products Co., Oakland, Calif.

Filed Dec. 11, 1969, Ser. No. 884,195
Int. Cl. F16k 3/04
U.S. Cl. 137—385 8 Claims



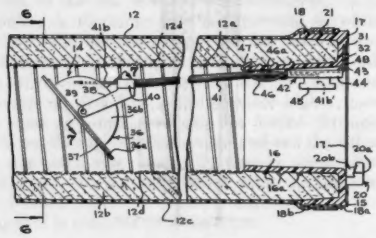
A slideable valve gate carries a spring pressed closure provided with a sheet resin facing which abuts a complementary ported facing on a way provided by the valve casing. An upstanding web on the valve casing has an integral transverse bearing by which a boxlike lever is pivoted to the casing, such lever having linkage connecting it with the valve gate. Springs centrally anchored to and projecting oppositely from the aforesaid web are adjustably connected at their ends to the boxlike lever by polygonal elements adjustable in the lever for varying spring tension. A fin projecting upwardly from the web is apertured to receive a lock, said fin projecting through a slot in the boxlike lever so that when the lock is in place the valve cannot be opened.

The lever has a U-shaped handle for the legs of which it provides separate openings beyond which the lever has dog portions engaged with notches in the legs of the handle for retaining the handle in assembly with the lever.

3,605,797
SHUT OFF DAMPER ASSEMBLY FOR HIGH VELOCITY DUCTED AIR TYPE CONDITIONING SYSTEM

John J. Dieckmann, Harrisonburg, Donald V. Bowman, Dayton, and Anthony M. Castello, Harrisonburg, Va., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed May 18, 1970, Ser. No. 38,072
Int. Cl. F16k 27/00, 1/22; F24f 13/06
U.S. Cl. 137—375 15 Claims

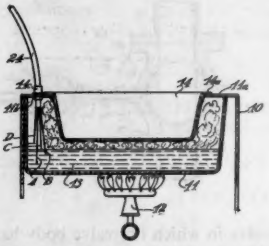


A shut off damper assembly which can be installed as a unit in an already installed sound attenuating flexible air tube for high velocity conditioned air. The air tube has a quick connector at its downstream end for connection to an orifice device and the damper assembly includes a pivoted damper to be inserted in the air tube to occupy a location spaced upstream from the connector and a clip member to be detachably mounted on the connector and support a Bowden cable sheath and a slide member for actuating the Bowden cable wire attached to the damper to control its angular position.

3,605,798
WATER LEVEL CONTROLS FOR STEAM TABLES AND THE LIKE

Carl P. Green, 25 N. Racine Ave. 60607, and Basil N. Burnetti, 2421 N. Washtenaw Ave. 60647, both of Chicago, Ill.

Filed Apr. 2, 1970, Ser. No. 25,217
Int. Cl. G05d 9/12
U.S. Cl. 137—392 14 Claims

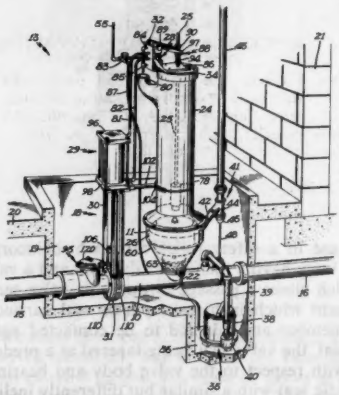


A unit accessory to steam tables and the like for automatically replenishing the supply of water in the trough of the steam table when the water level falls to a low limit, to shut off the water supply when the water level rises to a routine high level, and to shut off the power in case the water shut-off facility fails and the water rises to an extremely high level. The unit operates an emergency red signal lamp at the lowest and highest water levels and an amber signal lamp during normal operation. The unit employs a set of electrodes which depend to different levels in the water trough, and are responsive to water contact at their lower ends to form circuits employing the conductivity of the water and a solenoid-actuated valve to turn on the water.

3,605,799
SEWER FLOODING CONTROL SYSTEM

Lloyd G. Cherne, 5704 View Lane, Minneapolis, Minn. 55424

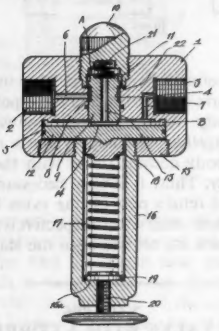
Filed Apr. 24, 1970, Ser. No. 31,586
Int. Cl. F16k 31/26
U.S. Cl. 137—413 10 Claims



An improved sewer flooding control system utilized to prevent the flooding of a building basement because of a backup in the building sewer or the surging of sewage in the sewer. The improved sewer flooding control system is mounted below the floor level of a basement to be pro-

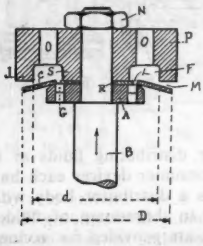
tected and is actuated by the presence of sewer flooding conditions in the sewer. The improved system also provides novel means for preventing flooding or damage as a result of surging sewage both in the basement as well as within the system, and also provides novel guide means for guiding a float and preventing damage from surging. When flooding conditions exist, a float member rises with the level of the sewage, and in turn, causes a valve to close in the sewer pipe, thereby preventing any flow of sewage through the pipe. When flooding conditions subside, the float is correspondingly lowered with the level of sewage and the valve is opened.

3,605,800
AUTOMATIC REGULATING VALVE
Kichiro Satoh, 29 Uguisudani-machi, Shibuya-ku, Tokyo, Japan
Filed Oct. 20, 1969, Ser. No. 867,443
Int. Cl. F16k *31/12*
U.S. Cl. 137—505.18 **1 Claim**



An automatic regulating valve to assure the constant flow and the constant pressure on the secondary side regardless of any changes of the pressure on the first side, in which a valve body is provided with a neck portion defining upper and lower surfaces receiving the same pressure and an adjusting means acts on the valve body and maintains the predetermined pressure.

3,605,801
SHOCK ABSORBER PISTON WITH FLOATING VALVE
Christian Bourcier de Carbon, 64 Boulevard Maurice-Barres, 92 Neuilly-sur-Seine, France
Filed Feb. 28, 1969, Ser. No. 803,363
Claims priority, application France, Mar. 1, 1968, 142,058
Int. Cl. F16d *57/00*
U.S. Cl. 137—513.7 **4 Claims**



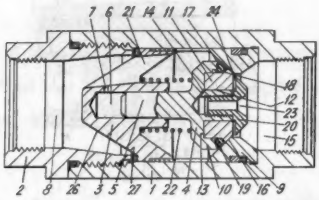
The shock absorber valving includes an upper radially outwardly disposed annular seat and a lower radially inwardly disposed annular seat and a floating annular thin disc valve element having a radially outward portion adapted to seat against the first named seat and a radially inward portion adapted to seat against the second named seat; a fixed washer rigid with said lower second named seat, disposed approximately co-planar with the valve disc, but having an outside diameter slightly smaller than the inside diameter of the annular valve disc, whereby a narrow annular slit by-pass passageway is provided. Underlying said washer, the lower seat member is provided with a series of openings forming continuations of said narrow slit passageway. Alternatively, an annular groove or trough can be provided immediately beneath the slit and a series of separate passageways below the groove.

Importantly, the outer portion of said valve disc has virtually line contact with the upper outer annular seat inwardly of the periphery of the disc, the diameter D of the disc and the diameter *d* of the circular line of contact bearing the relationship

$$\frac{D-d}{d}$$

is equal to or greater than approximately 15%.

3,605,802
CHECK VALVE
Siegfried Hertell, Kelsterbach (Main), Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,219
Claims priority, application Germany, Nov. 2, 1968, P 18 06 748.6
Int. Cl. F16k *15/06, 25/02*
U.S. Cl. 137—514.5 **10 Claims**

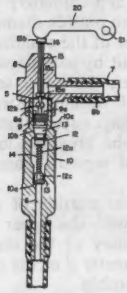


A check valve having a spring-loaded poppet held against an annular valve seat with means for damping the movement of the poppet in both opening and closing directions. The stem of the poppet moves in a blind bore, the bottom of which is connected to the downstream side of the valve by a restricted passageway to provide damping when the valve is opening. A damping element on the poppet head contacts the seat as the valve closes to force fluid out of an annular chamber behind the damper to provide damping in the closing direction.

3,605,803
VALVE
Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133
Filed Feb. 24, 1970, Ser. No. 13,549
Int. Cl. F16k *11/04*
U.S. Cl. 137—596.1 **4 Claims**

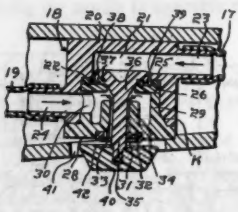
This invention pertains to a very simple through valve using the insides of an ordinary tire valve with a modified cap with outlet port and incorporating a plunger with a groove or flat to provide a controlled bleed when the plunger is not fully depressed and providing a non-metallic seat to close off said bleed when the plunger is fully

depressed for controlled flow of a fluid such as suction from the intake of an engine to operate a suction operated



motor including a diaphragm and enclosure with the diaphragm operating against a spring as in a suction operated spark advance or ventilating temperature control.

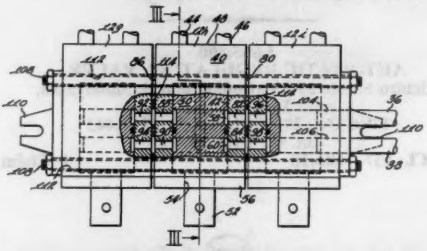
3,605,804
THREE- AND FOUR-WAY VALVES
David G. Way, Boxborough, Mass., assignor to Tapeler Corporation, Newton, Mass.
Filed Oct. 9, 1969, Ser. No. 864,985
Int. Cl. F16k *11/02*
U.S. Cl. 137—596.2 **13 Claims**



Valves are disclosed that have a member provided with a chamber open at one end in the case of a three-way valve and at both ends in the case of a four-way valve. The chambers have an internal shoulder accessible through each open end and ports on each side of their shoulders, the ports remote from the open ends being inlets. Seats each having a central port, are held against the shoulders by closures for the open ends, each closure also including a seat having a central relief port. The valves have stems extending freely through their central ports, each stem provided with seat engaging heads spaced for alternate engagement with an inlet and a relief seat. One particular combination of a valve and an air-operated device and various modes of valve operation are also disclosed.

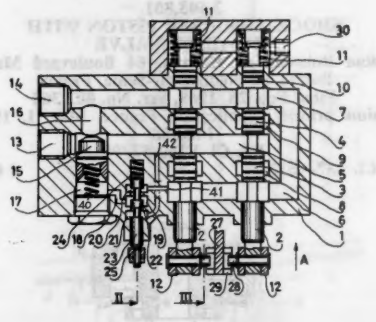
3,605,805
STACKABLE ROTARY VALVES
Matthew L. Worrix, Sheridan, Oreg., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Oct. 24, 1969, Ser. No. 869,037
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.12 **2 Claims**

A system for controlling a plurality of actuators operable from a source of pressurized fluid comprises a plurality of rotary valves, one valve for each actuator, designed to be stacked together in a compact unit or arrangement. Each valve comprises a body having a cavity in which a rotary cylindrical valve member is located. The valve member has two annular grooves therein, one of which is a fluid supply chamber and the other of which is a fluid return chamber. Each chamber is alternatively connectable through passages in the valve member to either of two actuator ports in the valve body. The actuator ports are connected to an actuator. The supply



chamber and return chamber are also in communication with supply ports and return ports, respectively, provided in the valve body. When a plurality of valves are stacked and secured together, the supply ports and return ports of one valve body communicate with those of any adjacent valve body. Thus, it is only necessary to connect the supply port and return port of one valve body to the fluid source and fluid reservoir, respectively, to effect fluid supply and return for all valves in the stack, regardless of their number.

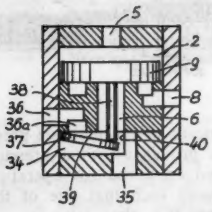
3,605,806
SLIDE VALVE WITH A CORRELATED RELIEF VALVE
Francesco Coatti, Montorio, Italy, assignor to M.I.T.A. Macchine Infilzatrici Tabacco Automatiche S.a.r.l., Verona, Italy
Filed Feb. 17, 1970, Ser. No. 12,110
Claims priority, application France, Feb. 26, 1969, 61,218/69
Int. Cl. F16k *11/18*
U.S. Cl. 137—596.13 **4 Claims**



A device for distributing fluids at high pressure, to a number of consumer devices each having an inlet and an exhaust, has a distributor body with a feed passage for connection to the source of fluid, and an exhaust passage. Means are provided for connection of the feed and exhaust passages to the consumer devices, and a corresponding number of valves in the distributor body

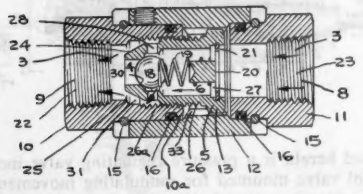
serve to connect the feed and exhaust passages selectively to the respective consumer devices. A communication is provided directly between the feed passage and the exhaust passage, and an auxiliary valve therein is associated with the plurality of valves so that said auxiliary valve is closed when any one of the plurality of valves is actuated.

3,605,807
SWITCHING ELEMENTS FOR A HYDRAULIC OR PNEUMATIC CONTROL SYSTEM
Hanns-Dieter Paschke, Neckarsulm, Olgaweg 6, Germany
Filed Sept. 9, 1968, Ser. No. 758,512
Claims priority, application Germany, Sept. 13, 1967, P 16 50 501.4; Jan. 26, 1968, P 16 75 370.1; Feb. 16, 1968, P 16 75 511.6
Int. Cl. F16k *31/143*
U.S. Cl. 137—596.18 **3 Claims**



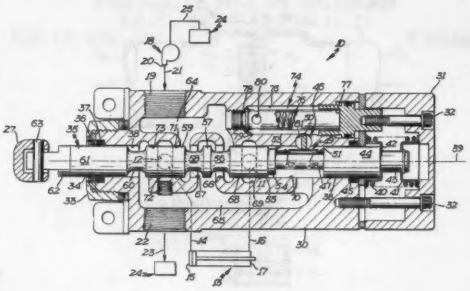
A fluid switching valve having input, output, and control lines, and a valve chamber formed with valve seats for the control line and the ouput line, and containing a disc valve which is movable in the chamber between the valve seats, under the influence of the pressure in the control line, there being a fluid clearance around the disc valve which is of smaller effective area than the cross-sectional area of the input line. The valve may be arranged optionally either to close or open the output line on an increase in pressure in the control line, and may also be arranged to connect the output line selectively to a relief port. The valve may be included in digital switching circuits provided on digital logic function, for example AND, OR, and NOR.

3,605,808
IN-LINE EXTERNALLY ADJUSTABLE FLOW CONTROL AND NEEDLE VALVE ASSEMBLY
Robert M. Fisher, 20966 Los Flores Mesa Drive, Malibu, Calif. 90265
Filed June 23, 1969, Ser. No. 835,588
Int. Cl. F16k *15/18*
U.S. Cl. 137—599.2 **2 Claims**



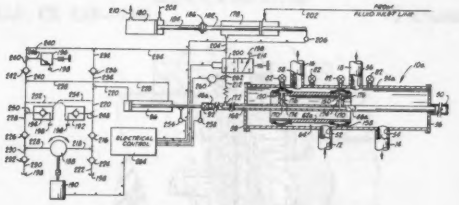
A compact in-line flow-control valve and needle valve assembly is disclosed wherein an externally adjustable needle valve element is adjustable to permit a predetermined restricted flow in both directions or may include a spring-loaded ball assembly by which flow is restricted in one direction with free-flow thru ball assembly when flow is reversed.

3,605,809
HYDRAULIC VALVE
Clayton W. Thorson, Edina, Minn., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Oct. 29, 1969, Ser. No. 872,114
Int. Cl. F16k *11/02, 31/143*
U.S. Cl. 137—624.27 **7 Claims**



A four-way, three position, hydraulic valve of the automatic return to neutral type wherein the automatic return mechanism is protected from flow of working fluid and is sensitive and responsive to system fluid flow from approximately ½ g.p.m. to over 20 g.p.m.

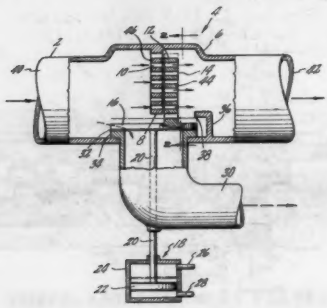
3,605,810
FLOW DIVERTER VALVE
Bernard M. Moroney, Tulsa, Okla., assignor to Metric, Inc., Tulsa, Okla.
Filed Nov. 18, 1968, Ser. No. 776,508
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.43 **11 Claims**



A flow diverter valve which includes an elongated, hollow external barrel concentrically surrounding a shorter hollow internal barrel and defining an annulus therewith. Annular seals are secured to opposite end portions of the internal barrel and engage the internal wall of the external barrel to prevent fluid flow past the seals between the barrels. A device is provided for reciprocating in the external barrel, the internal barrel and the seals secured thereto. A plurality of ports are provided through the external barrel in axially spaced relation therealong so that in one position of said internal barrel, some of the ports are placed in fluid communication through said annulus concurrently with the placement of the remaining of the ports in fluid communication through the interior

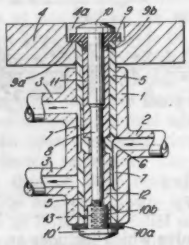
of said hollow internal barrel, and in a second position of the internal barrel, pairing of the ports which are in fluid communication is altered.

3,605,811
CONTROLLED IMPEDANCE DIVERTER VALVE
John S. Lovell, Bloomfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 14, 1968, Ser. No. 775,674
Int. Cl. F16k *11/14*
U.S. Cl. 137—625.49 5 Claims



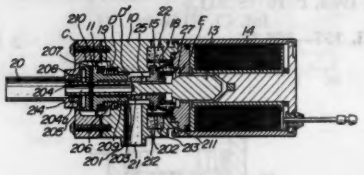
A controlled impedance diverter valve is provided by the combination of a poppet valve and a gate valve which requires small displacement to go from open to closed position.

3,605,812
MULTIPLE WAY STOPCOCKS
Wilhelm Anton Richter, deceased, late of Staffordshire, England, by Hilda Rosina Richter, executrix, Staffordshire, England, assignor to Quickfit & Quartz Limited, Walton, Stone, England
Filed Sept. 29, 1969, Ser. No. 870,593
Claims priority, application Great Britain, Oct. 16, 1968, 49,040/68
Int. Cl. F16h *11/02*
U.S. Cl. 137—627.5 11 Claims



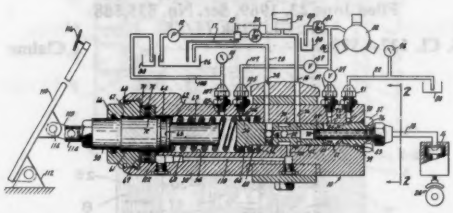
A cock comprising a body with inlet and outlet ports, a bore through the body having an obturating assembly slidable therein, either rotatably or longitudinally, the obturating assembly having a liner, a clamping device within and spaced from the liner, an elastomer e.g. polytetrafluoroethylene filling the space, glands and a device operable to vary the length of the clamping device with the glands engaging the ends of the elastomer filling to vary the radial pressure of the liner against the walls of the body bore, and grooving in the liner to provide for fluid flow between the inlet and the outlet ports.

3,605,813
CONTROL VALVE MEANS OF THE NEGATIVE PRESSURE DIFFERENTIAL TYPE
Yoshiaki Nakano, Gifu-shi, Atutoshi Okamoto, Toyohashi-shi, Noriyoshi Ando and Koichi Taniguchi, Kariya-shi, and Koichi Toyama, Toyohashi-shi, Japan, assignors to Nippon Denso Company Limited, Kariya-shi, Japan
Continuation-in-part of application Ser. No. 814,937, Apr. 10, 1969. This application June 9, 1969, Ser. No. 831,651
Claims priority, application Japan, Apr. 10, 1968, 43/29,219; Aug. 29, 1968, 43/74,608
Int. Cl. F16k *11/24*
U.S. Cl. 137—627.5 7 Claims



Control valve means of the negative pressure differential type which is provided with a pressure comparing diaphragm mounted on a rod for operating valves, the valves being operated such that one of them is closed simultaneously when the other valve is opened, and the rod being operated by a solenoid. The negative pressure differential between a chamber on one side of the diaphragm and a chamber on the other side thereof can be controlled by maintaining balance between said negative pressure differential and a force exerted by said solenoid on a plunger. This control valve means has particular utility in an anti-skid mechanism for motor vehicles. In this application, the control valve means permits to control and maintain the braking hydraulic pressure at a predetermined level when the braking force is released by the anti-skid mechanism.

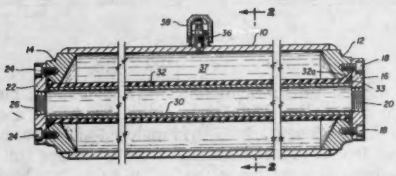
3,605,814
PRESSURE REGULATING VALVE
Richard O. Gordon, Belgium, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.
Filed Nov. 6, 1969, Ser. No. 874,443
Int. Cl. F16k *11/07, 29/00;* B60t *13/16*
U.S. Cl. 137—636 15 Claims



Disclosed herein is a pressure regulating valve including a spool valve mounted for modulating movement in a valve passage to control the admission of high pressure hydraulic fluid into the valve passage and having a fluid flow passage, a piston positioned in the valve passage and operatively associated with said fluid flow passage to define a hysteresis chamber in the valve passage and a reaction chamber in the fluid flow passage in the

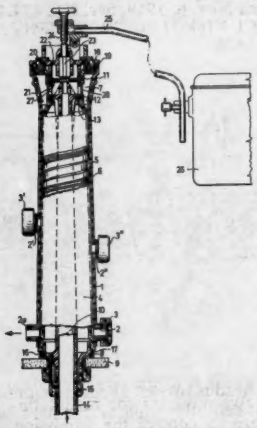
spool valve, a fluid piston pump connected to the valve to provide a pulsating force at each end of the spool valve and a control valve connected to control the pressure of the pulsating fluid at each end of the spool valve. A hydraulic power assist is provided for actuating the spool valve when operating under heavy loads.

3,605,815
PRESSURE ACCUMULATOR
Kenneth J. Von Forell, P.O. Box 2176, Industrial Park, Fort Collins, Colo. 80521
Filed Nov. 12, 1969, Ser. No. 875,731
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **1 Claim**



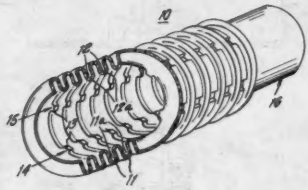
A gas pressure charged, tubular diaphragm, pressure accumulator having a flow tube formed of sintered metal providing communication passages for the tubular diaphragm and a liquid under pressure in the flow tube, so that the gas absorbs sudden surges of flow and pressure in the liquid flow line. The sintered metal flow tube in the accumulator provides full open communication between the liquid and the diaphragm but prevents extruding of the diaphragm material through the openings at high gas pressures and low liquid pressures.

3,605,816
SOUND DAMPER FOR PRESSURE WATER CONDUITS
Sten Lennart Nilsson, Nacka, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Sept. 18, 1969, Ser. No. 858,930
Claims priority, application Sweden, Dec. 6, 1968, 16,755/68
Int. Cl. F16k *47/02*; F16l *55/02*
U.S. Cl. 138—43 **5 Claims**



A sound damper for pressure water conduits having a tubular casing connected to an inlet tube with a valve wherein an insert is fitted into the inside of the casing and has at least two independent helical grooves in its outer surface, which grooves together with the inner wall of the casing define helical channels which at one end open into a space within the casing communicating with the outlet of the valve. The opposite ends of said channels lead each into a closable outlet on the casing.

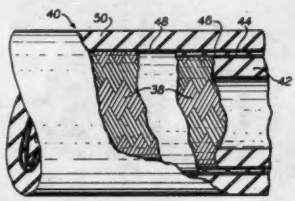
3,605,817
FLEXIBLE CORRUGATED TUBING HAVING IMPROVED PERFORMANCE CHARACTERISTICS
Joseph F. Bauman, Trenton, and Edward Kurtz, Jr., Hamilton Square, N.J., and Adrian V. Cini, Levittown, Pa., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.
Filed Sept. 22, 1969, Ser. No. 859,639
Int. Cl. A47l *9/24*; F16l *11/12*
U.S. Cl. 138—121 **7 Claims**



Flexible corrugated tubing, preferably formed of a thermoplastic material having a configuration for eliminating annoying whistling which occurs in conventional tubing used for moving air at relatively high velocities. The pitch and/or roughness of the tubing interior surface is controlled during formation of the tubing.

The tubing may be formed in a continuous process, for example, in the manner described in U.S. Pat. 3,280,430, issued Oct. 25, 1966, which is further provided with means combined within the molds to control the configuration of the tubing.

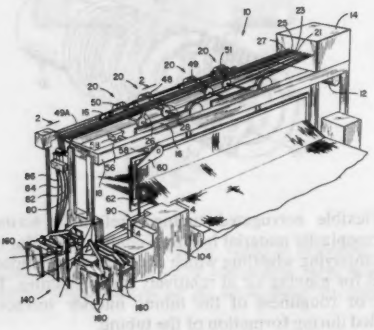
3,605,818
HIGH PRESSURE HOSE
Adolph J. Balchan, Paterson, N.J., assignor to Uniroyal, Inc., New York, N.Y.
Filed Jan. 2, 1968, Ser. No. 695,163
Int. Cl. F16l *11/08*
U.S. Cl. 138—126 **7 Claims**



Method of making a package of reinforcing ribbon. Involves impregnating substantially untwisted multi-filament yarns with wet polymeric binder, bringing the impregnating yarns together in a side-by-side relationship with adjacent edges touching, winding the yarns about a core while still wet with the binder, and drying. Further relates to resulting ribbon package, wherein the yarns are bonded to one another at their adjacent edges to form the ribbon and wherein adjacent layers of the ribbon are weakly bonded to one another, so that an outer ribbon layer is readily strippable from a layer therebeneath. Also

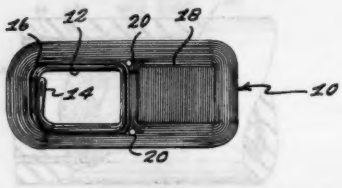
discloses a textile-reinforced high pressure hose utilizing the ribbon in the textile reinforcement. Hose comprises a rubbery interior tube, a ply of reinforcing textile wrapped therearound, and a second rubbery tube disposed about this ply, the reinforcing textile being made up of the polymeric binder-impregnated ribbon, the interior and second rubbery tubes being vulcanized to the binder and hence tenaciously secured to the binder-impregnated textile ply.

3,605,819
FOUR COLOR PICK SELECTOR MECHANISM
O'Neal Smith, 3469 Sylvan Lane, Ellicott City, Md. 21043
Filed Jan. 26, 1970, Ser. No. 5,627
Int. Cl. D03d *47/24*
U.S. Cl. 139—126 7 Claims



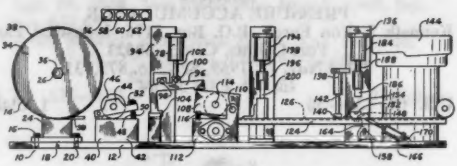
A weaving machine of the Jacquard type is disclosed wherein multiple weft supply choices by the dobby head are executed through a cam arrangement.

3,605,820
LOOP PICKER FOR LOOMS AND METHOD OF FORMING SAME
Kyle Campbell, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.
Filed Nov. 26, 1969, Ser. No. 880,211
Int. Cl. D03d *49/36*
U.S. Cl. 139—159 8 Claims



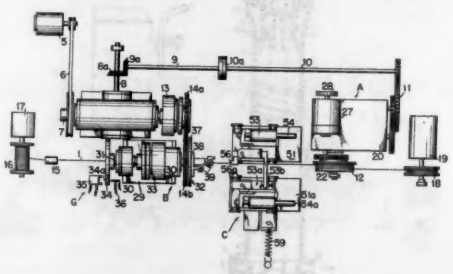
A loop picker for looms of the type formed by molding assembled layers of rubberized fabric during a vulcanizing cure is improved by interposing a layer of thermoplastic material (e.g., nylon fabric) in the rubberized fabric layers surrounding the picker stick hole or "loop" provided in the picker body and subjecting this interposed layer to the vulcanizing cure and molding along with the rubberized fabric layers. The resulting picker can have the loop thereof sized to fit a picker stick on which it is to be installed with a grip effective enough to eliminate any need for glue or screw fastening such as is commonly employed for maintaining pickers of this sort in place during use.

3,605,821
BINDING STRIP MEASURING AND ASSEMBLY MECHANISM
Brown Isaacs, 702 Ave. B, South Houston, Tex. 77011
Filed Aug. 15, 1969, Ser. No. 850,566
Int. Cl. B21f *9/02, 45/16*
U.S. Cl. 140—1 11 Claims



A mechanism for automatically assembling a binding clip to one extremity of a strip of metal material, measuring a desired length of the strip material and severing the desired length of strip material from a storage roll. The mechanism is provided with a strip guide bar having a strip guide groove formed therein. A brake mechanism, a strip drive mechanism, and a strip extremity immobilizing mechanisms, are disposed adjacent the strip guide groove to control movement of the strip material. A strip cutter, a strip binding apparatus, and a clip fastening device are provided adjacent the strip guide groove to perform cutting, bending, and fastening operations on the strip material. A clip orienting and feed device is provided to orient binding clips so that a clip may be connected to the free extremity of the strip material. Control of the entire mechanism is achieved by an adjustable sequence timing control device which is responsive to linear movement of the strip material being driven.

3,605,822
APPARATUS FOR WINDING COILS TO FORM A STRAIGHT LEG PORTION BETWEEN ADJACENT COIL SECTIONS
Takashi Noguchi, Sagamihara-shi, and Takashi Takahashi, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Dec. 4, 1968, Ser. No. 781,168
Int. Cl. B21f *3/04*
U.S. Cl. 140—71.5 3 Claims



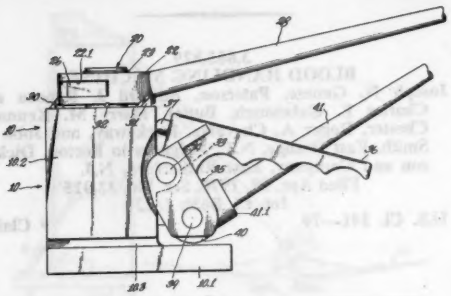
A coiling head is rotated about a continuously advanced mandrel to helically wind a filament wire about the mandrel to form coil sections and while the rotation of the coiling head is being stopped the mandrel and filament wire are clamped by chucks and advanced straightly to form the straight leg portion between adjacent coil sections.

3,605,823

BANDING APPARATUS

Peter Fromm, Zurich, Switzerland, assignor to A. Fromm G.m.b.H., Zurich, Switzerland

Filed Feb. 17, 1969, Ser. No. 799,782
Int. Cl. B21f 9/02; B25b
U.S. Cl. 140—93.2 6 Claims



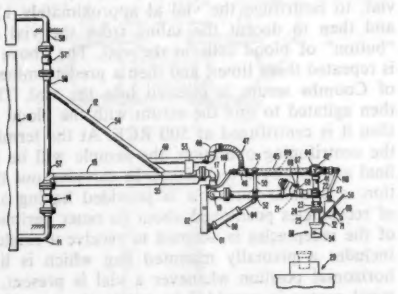
A tool for fastening together overlapped band portions and providing upper and lower die members for receiving such band portions therebetween. The upper die member is vertically movable toward the lower die member to form tongues in respective band portions which interlock with each other, such movement of the upper die member being effected by an actuating member rotatable about a vertical axis and having a helical cam surface for effecting such die member movement.

3,605,824

METHOD AND SYSTEM FOR LOADING LIQUID INTO A CONTAINER OR THE LIKE

Michael J. Madden, West Covina, Calif., Robert L. Murray, Dayton, Ky., and Stephen C. Lemon and Paul R. Ostand, Cincinnati, Ohio, assignors to Dover Corporation, Cincinnati, Ohio

Filed Sept. 20, 1968, Ser. No. 761,236
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—1 13 Claims



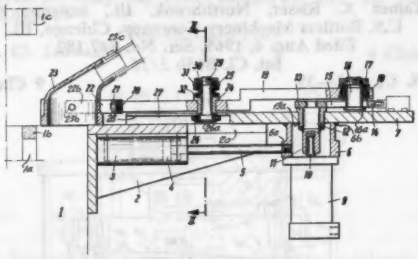
This disclosure relates to an apparatus and method whereby liquid is supplied to a container from a supply line only when a vapor seal is formed between the supply line and the container. Flow of liquid is automatically stopped when the liquid in the tank reaches a predetermined level, when the pressure in the tank exceeds a predetermined value, or when the vapor seal is broken. Vapor is removed from the container during filling thereof. When filling ceases or the supply line is no longer vapor sealed to the container, the vapor removal line is automatically blocked to prevent escape of vapors into the atmosphere.

3,605,825

METHOD AND APPARATUS FOR FILLING THE DIE OF A POWDER PRESS, ESPECIALLY OF A METAL POWDER PRESS

Rolf Hermes, Rheydt-Giesenkirchen, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchen-Gladbach, Germany

Filed Sept. 30, 1969, Ser. No. 862,294
Claims priority, application Germany, Oct. 2, 1968, P 18 01 397.3
Int. Cl. B22f 9/00
U.S. Cl. 141—1 15 Claims



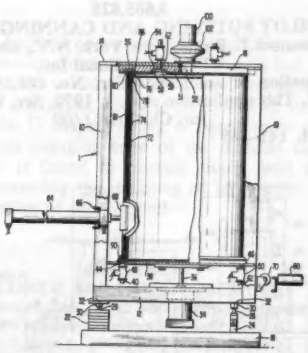
Filling the die of a powder press, especially of a metal powder press, wherein the powder is filled into the die or matrix through a filler member which performs a rotational movement, particularly a substantially circular rotational movement. The apparatus for performing such filling process comprises a filler member which is attached to one end of a lever, the other end of which is connected to a crank drive arrangement. The lever itself is supported, preferably at its center, in a longitudinal slot of a lever support member which is in turn slidably supported on a base member and driven by a piston and cylinder arrangement operatively positioned between the base member and the lever support member. The crank drive is driven by a motor connected through a shaft to the crank drive, the shaft extending preferably through said lever support member.

3,605,826

METHOD AND APPARATUS FOR FILLING CONTAINERS

Clarence F. Carter, Danville, Ill., assignor to Carter Engineering Company

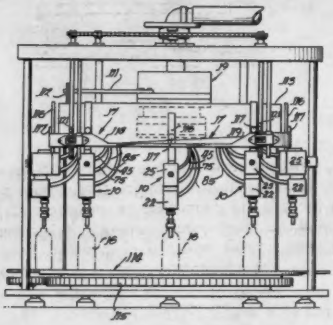
Filed May 1, 1970, Ser. No. 33,775
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—5 19 Claims



The disclosure relates to a method and apparatus for filling containers with particulate material by at least partially surrounding the container with a shroud which sealingly engages the container to provide a barrier between the shroud and the mouth of the container. The

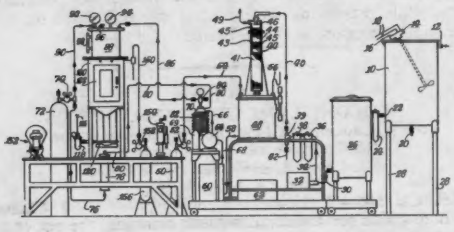
container is loaded into a container filling zone, filled, and unloaded from the container filling zone with the barrier between the shroud and the container, thereby preventing contamination of the shroud interior and the container exterior. A dust collecting system is operable to prevent contamination by particle dust and particulate material while loading and unloading containers into and out of the filling zone.

3,605,827
ROTARY FILLING MACHINE
James A. Risser, Northbrook, Ill., assignor to U.S. Bottlers Machinery Company, Chicago, Ill.
Filed Aug. 4, 1969, Ser. No. 847,182
Int. Cl. B65b *3/26*
U.S. Cl. 141—39 **9 Claims**



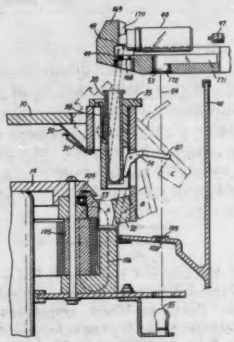
A rotary filling machine having spaced cam-controlled filler heads or units with depending filling stems which are automatically lowered and raised for accurate level filling of containers or bottles of any suitable material, each filler head when lowered enters its filling stem in the opening or neck of a container, sealing and air sensing its container before filling, and rejecting a defective container whereby only those containers which are leakproof under air pressure are filled with the desired volume of the liquid product. The filling head or unit includes a flexible sensing diaphragm and a ported plunger providing an air valve, and a flexible diaphragm and plunger having a valve controlling product flow, each operated by an air flow system, and vacuum signals determining when to commence filling and when to stop.

3,605,828
PILOT BOTTLING AND CANNING UNIT
Emanuel T. Bohm, New York, N.Y., assignor to CPC International Inc.
Continuation of application Ser. No. 660,293, Aug. 14, 1967. This application Apr. 1, 1970, Ser. No. 22,130
Int. Cl. C02d *1/00*
U.S. Cl. 141—69 **8 Claims**



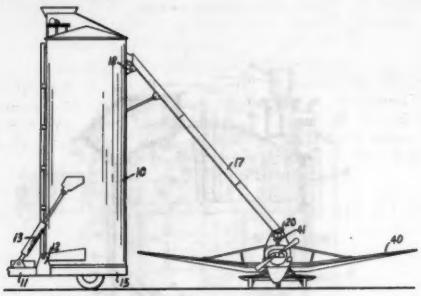
A pilot unit for bottling and canning small quantities of soft drink beverages, whereby ingredients can be mixed under controlled conditions to permit testing of the results of ingredient variations. The unit includes means for preparing and storing the water to be used, provides means for carbonating the water, and permits packaging of the beverage in a carbon dioxide atmosphere, whereby specified manufacturing conditions can be duplicated, or varied, as desired.

3,605,829
BLOOD HANDLING MACHINE
Joseph N. Genese, Paterson, Edward J. Rapoza and Charles F. Galanaugh, Butler, Harry M. Kennard, Chester, Roger A. Chevalaz, Rockaway, and John A. Smith, East Orange, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Apr. 29, 1970, Ser. No. 32,915
Int. Cl. B65b *1/22*
U.S. Cl. 141—79 **9 Claims**



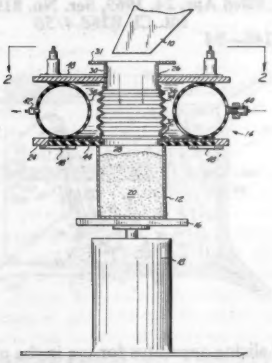
An apparatus for automatically performing a series of operations on a blood sample contained in a vial. For example, in performing the Coombs antiglobulin test, the apparatus is programmed to initially inject saline into the vial, to centrifuge the vial at approximately 1300 RCF, and then to decant the saline from the vial leaving a "button" of blood cells in the vial. The above sequence is repeated three times, and then a predetermined amount of Coombs serum is injected into the vial. The vial is then agitated to mix the serum with the blood cells, and then it is centrifuged at 500 RCF. At the termination of the centrifuging operation, the sample will be ready for final analysis by a technician. In carrying out this invention, a circular turntable is provided having a plurality of receptacles positioned about its outer periphery. Each of the receptacles is adapted to receive a single vial and includes a pivotally mounted flag which is lifted to a horizontal position whenever a vial is present. An electrical motor is provided to rotate the turntable, and a dispensing mechanism overlies the periphery of the turntable and includes a nozzle for injecting the saline as well as a nozzle for injecting the Coombs serum downwardly into the vial. A photoelectric mechanism is provided for detecting a horizontal flag which then actuates the appropriate injection mechanism. The Coombs injecting mechanism includes a removable cartridge containing the serum. The cartridge comprises a tubular barrel which is closed at its forward end by a nozzle and at its rear end by a cylindrical piston positioned within the bore of the barrel. The mechanism further includes a plunger for driving the piston into the bore of the barrel to dispense the liquid from the forward nozzle.

3,605,830
DISPENSING DEVICE FOR STORAGE BIN
Roy Haskins, % The Haskins Co., Inc., P.O. Box 4215, Station B, Spokane, Wash. 99202
Filed Oct. 21, 1968, Ser. No. 769,030
Int. Cl. B67c *3/26*; B65b *1/04*; B60p *1/04*
U.S. Cl. 141—284 5 Claims



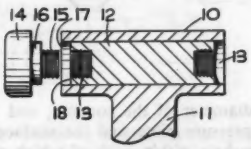
A dispensing device is described for a portable cylindrical storage bin to discharge a full load of agricultural chemicals into an airplane. The dispensing device includes a vertical conveyor, a chute and elongated spout pivotally mounted to the exterior of the bin. The spout is pivoted by a hydraulic cylinder to position a discharge opening over the body of the airplane.

3,605,831
INFLATABLE CLOSURE DEVICE
Cecil Patrick Michael Mitchell, Wyandotte, and Charles William Axce, Trenton, Mich., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich.
Filed Dec. 8, 1969, Ser. No. 882,988
Int. Cl. B65b *1/04*, *3/04*
U.S. Cl. 141—388 5 Claims



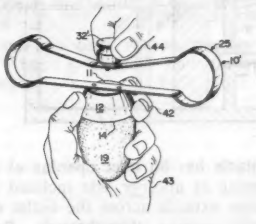
Apparatus for delivering pulverulent material to a receiving drum includes a feed chute and a drum loading closure device. The device, itself, includes a pair of apertured support members having their respective apertures coaxially aligned. The support members are secured to a tunnelway which extends through the apertures and has one end thereof secured to the feed chute and its other end communicating with the drum. A toroidal element is concentrically disposed about the tunnelway in the space defined between the two support members. Sealing means is provided on the lower support member to provide a pressure-tight seal between the device and the drum. Included also are means for urging the device into engagement with the drum.

3,605,832
HAMMERS
Walter R. Stephens, Solihull, England, assignor to Thor Hammer Company Limited
Filed Oct. 10, 1968, Ser. No. 766,411
Claims priority, application Great Britain, Feb. 21, 1967, 8,078/67; May 30, 1967, 24,823/67; Oct. 19, 1967, 47,625/67
Int. Cl. B25d *1/02*
U.S. Cl. 145—29A 4 Claims



A hammer having one or two replaceable striking faces and comprising a head which is of tubular form and within which is fitted a removable insert, the or both replaceable striking faces being connected to the insert so that when in position the head, insert and the or both replaceable striking faces are all held rigidly together. Provision may be made for the accommodation of a quantity of metal shot.

3,605,833
EGGSHELL OPENER
Herman D. Strang, 308 Ridge St., Algonquin, Ill. 60102
Filed June 16, 1969, Ser. No. 833,618
Int. Cl. A47j *19/28*
U.S. Cl. 146—2E 4 Claims

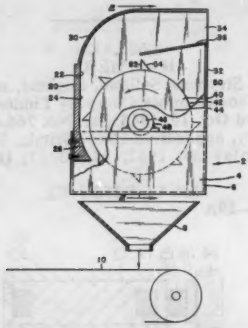


A sanitary eggshell opener includes a circular squared-edge skirt dependent from an anvil, a U shaped leaf spring, one arm of which is fixed to the cutter, the other arm being fixed to a hammer which is positioned to strike the anvil when the U shaped spring is flexed open and released. The egg-engaging edge of the circular cutter is squared. This is found to provide sharp, well defined line, while preventing the initiating of large chips in the remaining portion of the eggshell.

3,605,834
COCONUT BREAKING MACHINE
Luis E. Cancel, San Juan, Puerto Rico, assignor to the Commonwealth of Puerto Rico
Filed June 5, 1969, Ser. No. 830,621
Int. Cl. A23n *5/04*
U.S. Cl. 146—7 1 Claim

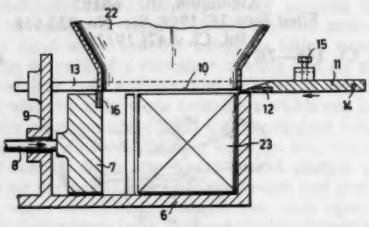
A machine for breaking, without crushing, the nut of a coconut, comprising a fixed smooth pressure plate and a rotating cylindrical drum the axis of which is parallel to the pressure plate. The drum has a smooth surface

spaced from the pressure plate a distance less than the diameter of the coconut and is provided with axially extending slats which are spaced apart a distance greater



than the diameter of the coconut, and which co-operate with the pressure plate and the surface of the drum to provide pockets within each of which a coconut is positioned to be pressed between the pressure plate and drum.

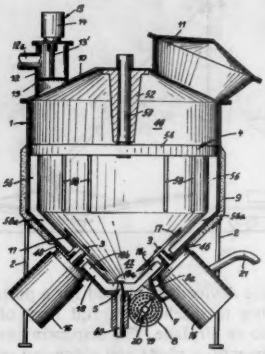
3,605,835
CUTTING APPARATUS FOR FOODSTUFFS AND THE LIKE
Ernst Holz, Hauptstrasse 76, Heidenheim-Schnaitheim, Germany
Filed July 9, 1969, Ser. No. 840,356
Claims priority, application Germany, July 12, 1968, P 17 79 153.6
Int. Cl. B26d *3/26*
U.S. Cl. 146—78R **10 Claims**



A receptacle has an inlet opening at one side and an outlet opening at another side inclined to the one side. Cutter means extends across the outlet opening so as to cut material issuing therethrough. Pusher means is mounted for advancing the receptacle in direction towards the outlet opening so as to push material therethrough. A hopper communicates with the inlet opening for introducing material into the receptacle. A severing blade is mounted for movement across the inlet opening at least substantially in the general plane of the latter to thereby sever and separate the material in the receptacle from the material in the hopper means.

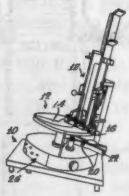
3,605,836
GRINDER WITH TEMPERATURE REGULATION AND STIRRING MEANS
Karl Schnell, Muhlstrasse 28, Winterback, near Stuttgart, Germany
Filed Dec. 11, 1968, Ser. No. 783,052
Claims priority, application Germany, Mar. 8, 1968, P 16 32 883.9
Int. Cl. B02c *18/12*
U.S. Cl. 146—79 **15 Claims**

A grinder construction, particularly for grinding meat, bread and similar products includes a large size receptacle or vessel having means for selectively heating and cooling the contents to be treated therein. The lower end of the vessel is conically shaped and terminates in an opening or conduit connected to a fine grinding machine. At least one rotating coarse grinding wheel is located within the vessel adjacent one of the oblique conical walls in the vicinity of the discharge to the fine grinding machine. The vessel also contains an upper rotatable stirrer and a lower rotatable stirrer, the latter including blades which



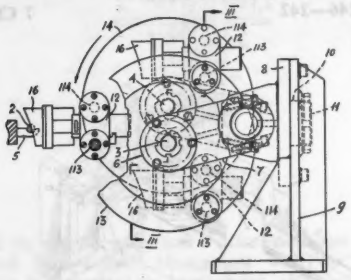
rotate past the opening to the fine grinder. A gas exhaust opening is defined at the upper end of the vessel and is advantageously connected to a vacuum pump so that processing can be effected under vacuum or air exclusion conditions so that the grinding material can be protected against acid and fermentation and can be stored for a longer period of time. A froth breaker is located in the gas discharge line adjacent the top of the vessel.

3,605,837
SLICER CONTROL SYSTEM
Robert D. Lambert, Fort Wayne, and Keith E. Flesch, Garrett, Ind., assignors to Peter Eckrich & Sons, Inc.
Filed Apr. 24, 1969, Ser. No. 819,017
Int. Cl. B26d *4/56*
U.S. Cl. 146—94 **16 Claims**



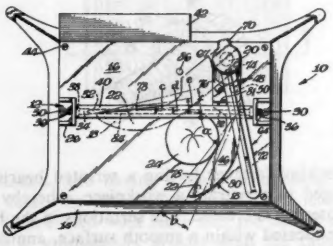
A food slicing apparatus for use in the process of fabricating multiple slice food packages for closely controlling the weight of each package to thereby minimize so-called "give-away." The apparatus includes a cutting area in which a blade is operative together with feeding means for feeding a food product having a generally uniform cross section into the cutting area. After each slice to go into a package is cut, the weight of the slices cut to that point is judged against a predetermined standard and an adjustment in the feed rate and the position of the blade within the cutting area is made after each slice is cut as required to alter slice thickness and thus weight to achieve a standard package weight.

3,605,838
CONTINUOUS CIGARETTE ROD CUTOFF
Goffredo Gianese, Bologna, Italy, assignor to American Machine & Foundry Company
Filed Sept. 29, 1969, Ser. No. 861,859
Claims priority, application Italy, Oct. 2, 1968, 7,373/68
Int. Cl. B26d 3/16
U.S. Cl. 146—101 10 Claims



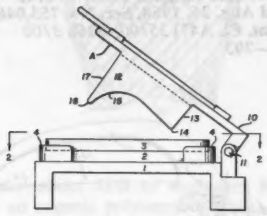
A blade for cutting a continuous cigarette rod into predetermined lengths is coupled to a link interposed between two crank members. Each crank member rotates about its own shaft, the two shafts being parallel and offset relative to each other, and parallel to the longitudinal axis of the continuous cigarette rod.

3,605,839
SLICING DEVICE
Samuel L. Gerson, Wilmington, Del., assignor to Restaurant Equipment Design Co., Wilmington, Del.
Continuation-in-part of application Ser. No. 673,147, Oct. 5, 1967. This application Nov. 18, 1968, Ser. No. 778,004
Int. Cl. B26d 3/26
U.S. Cl. 146—169 19 Claims



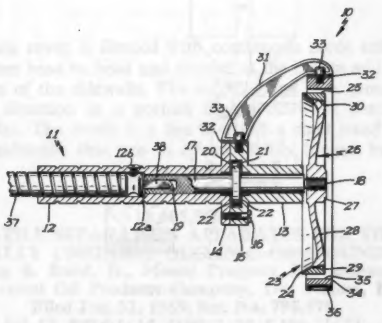
An array of spaced parallel bars is rotatably mounted to mesh between a rack of linear cutters. The bars rotate towards the cutters from an open angle to initially slide the object across the cutters to puncture it. The action changes in final closing stages to primarily pushing to help discharge the sliced object from between the cutters. This action is facilitated by making the portions of the bars extending through the cutter of scythe shape. The bars are conveniently rotated by connecting the boss of an operating handle to them adjacent their pivot upon the base. Operation downward vertically is highly efficient and together with serrated blades facilitates slicing harder vegetables like onions.

3,605,840
APPARATUS FOR COMMINUTING COMESTIBLES
Charles H. Morrett, 16 Willowbrook Road, Bromall, Pa. 19008
Filed July 17, 1969, Ser. No. 842,510
Int. Cl. B26d 3/26
U.S. Cl. 146—169 3 Claims



This invention relates to apparatus for comminuting fruit, vegetables and the like comprising superposed harps or sets of parallel cutting blades in which the blades in each set are laterally offset with respect to those in the other set, together with impeller blades of novel design whereby the article to be cut is first presented in a slightly rotative motion to the superior blade set and by them progressively severed into relatively thick slices, and then by the same motion of the impeller blades presented to the cutting blades of the inferior set whereby the thick slices are bifurcated and thus reduced to relatively thin ones; thereafter the slices may be piled together and rotated through 90° for reducing them to slivers which in a further pass may be "diced" if desired.

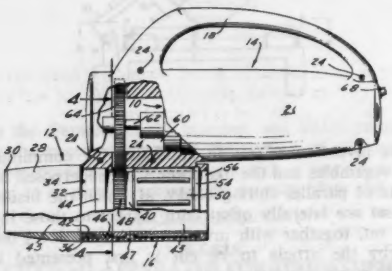
3,605,841
CUTTING DEVICE
Oscar H. Lindstrom and Nathan A. Fischer, Austin, Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.
Filed Mar. 24, 1970, Ser. No. 22,163
Int. Cl. A22c 17/12
U.S. Cl. 146—203 5 Claims



A cutting device for removing fat from a chunk of meat includes a handle having a revolvable shaft therein, which is connected at its forward end to an annular blade. An annular guard member is positioned around and spaced from the annular blade, and the guard member has a serrated exterior surface which is positioned against the surface of the meat which is to have the fat removed therefrom. In one form of the invention, a flexible drive

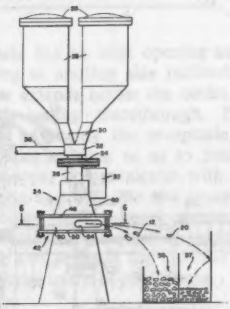
shaft is connected to a shaft in the handle, and in another form, an air motor is positioned interiorly of and constitutes a part of the handle for revolving the annular blade.

3,605,842
CUTTING TOOLS
Donald R. Kuri, 19395 E. Dairen St., Rowland Heights, Calif. 91745
Filed Aug. 26, 1968, Ser. No. 755,046
Int. Cl. A47j 25/00; B26b 3/00
U.S. Cl. 146—203 1 Claim



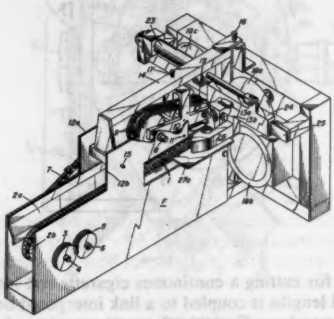
Power operated cutting apparatus having a hollow, rotatable cylindrical blade with a sharp annular cutting edge at the leading end. An electric motor is connected to the blade for rotating same.

3,605,843
CASHEW NUT SHELLER
Robert C. Dean, Jr., Norwich, and Richard W. Couch, Jr., South Royalton, Vt., assignors to Creare, Inc., Hanover, N.H.
Filed Jan. 2, 1970, Ser. No. 138
Int. Cl. A23h 5/00
U.S. Cl. 146—223 18 Claims



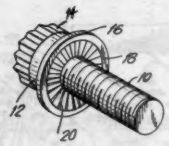
A method and apparatus for removing explosively the kernel of a cashew or similar nut from its shell while isolating the kernel from contamination. The explosive opening of the nut-shell results from a technique in which the nut initially is subjected to a compressed gas for a time interval during which the internal pressure of the nut is raised. The nut then is exploded rapidly, to a lower pressure which fractures the shell and separates the shell from the kernel. The nuts are isolated and exploded individually and in rapid, continuous succession. As each nut is exploded both its kernel and shell are ejected from the machine along different trajectories and are collected and sorted separately and automatically thus avoiding any contact between the separated shells and kernels.

3,605,844
CORN DEBUTTING MACHINE AND METHOD
Charles G. Peter Oldershaw, Avon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Aug. 14, 1969, Ser. No. 850,108
Int. Cl. A23n 15/04
U.S. Cl. 146—242 7 Claims



A machine for debutting corn including means for gauging the ears whereby minimum damage to the kernels and controlled depth of cut are obtained.

3,605,845
SELF-LOCKING FASTENER
Gerhard H. Junker, Bad Breisig, Germany, assignor to Standard Pressed Steel Co., Jenkintown, Pa.
Continuation-in-part of application Ser. No. 733,663, May 31, 1968. This application Oct. 3, 1969, Ser. No. 868,965
Int. Cl. F16b 39/282
U.S. Cl. 151—37 24 Claims

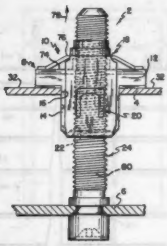


A self-locking fastener having a serrated bearing surface arranged to penetrate a workpiece, whereby resistance to loosening is created. The serrations in the bearing surface are located within a smooth surface, annular ring which, upon engagement with the workpiece, opposes further penetration of the serrations and controls the extent of penetration of the serrations.

3,605,846
FASTENING ASSEMBLY
Clarence R. Van Niel, North Olmsted, and William L. Seitz, Parma, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Sept. 24, 1969, Ser. No. 860,764
Int. Cl. F16b 13/04, 39/284
U.S. Cl. 151—41.75 4 Claims

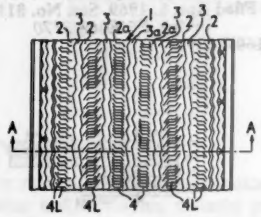
A fastening assembly for mounting with an apertured support panel including plug-like retainer member and attachable clip-like locking member adapted for resilient

mounting on said retainer member. The retainer member and locking member are adapted for insertion through the aperture in the support member, as a unit, and coact with one another to secure the assembly to the support member. The locking member is provided with locking elements which are disposed for engagement with one



side of the support panel, and a deformable base which is disposed for resilient engagement with the retainer member for interlocking engagement with the opposite side of the support member to enable relative movement of the locking member with respect to the retainer member and resilient mounting of the assembly with the support member.

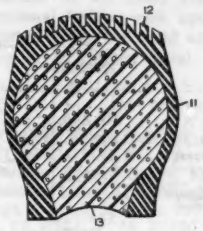
3,605,847
PNEUMATIC TIRES
Vernon E. Gough, Croyde, near Braunton, North Devon, England, assignor to Dunlop Holdings Limited, St. James, London, England
Filed July 7, 1969, Ser. No. 839,548
Claims priority, application Great Britain, July 9, 1968, 32,704/68
Int. Cl. B60c *11/12*
U.S. Cl. 152—209 **5 Claims**



A pneumatic tire having a tread comprising ribs, defining at least one intermediate groove. At least one of the ribs is provided with slots and the radial extent of said slots is substantially greater than the radial extent of the intermediate groove.

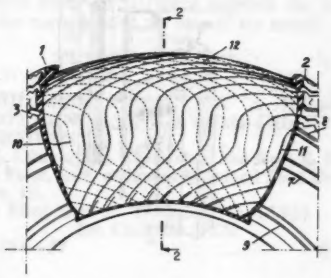
3,605,848
MICROCELLULAR URETHANE ELASTOMERS OF RELATIVELY LOW DENSITY
Frank G. Lombardi, Manchester, Conn., and Fritz Hostettler, Verona, N.J., assignors to Inter-Polymer Corporation, Passaic, N.J.
Filed Dec. 23, 1968, Ser. No. 785,929
Int. Cl. B60c *7/12*; C08g *22/48*; C08f *47/10*
U.S. Cl. 152—310 **6 Claims**

A bullet proof vehicle tire having a peripheral coating of solid polyurethane elastomers and a core of predominantly open-celled microcellular polyurethane elastomers having a density of from about 6 to about 25 pounds per cubic foot produced by the reaction of (a) a polyol con-



taining at least about 35% of secondary hydroxyl endgroups, (b) an organic polyisocyanate, (c) a surfactant, (d) a foaming agent, and (e) a catalyst.

3,605,849
TIRE COVER
Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, France
Filed Nov. 13, 1968, Ser. No. 795,759
Claims priority, application France, Nov. 13, 1967, 127,994; Sept. 19, 1968, 166,850
Int. Cl. B60c *9/10*
U.S. Cl. 152—356 **8 Claims**

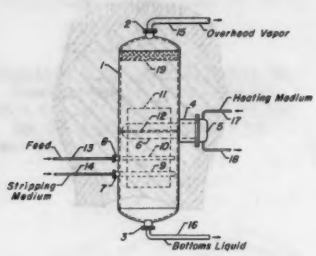


A tire cover is formed with continuous cords extending from bead to bead and crossed at the crown and in a portion of the sidewalls. The cords extend in a generally radial direction in a portion of the sidewalls near the shoulder. The result is a tire that has a rigid tread and rigid sidewalls that are in effect flexibly hinged to the tread.

3,605,850
VOLATILE SEPARATION APPARATUS FOR THERMALLY UNSTABLE ORGANIC COMPOUNDS
William B. Borst, Jr., Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Jan. 31, 1969, Ser. No. 795,578
Int. Cl. B01d *1/14, 3/00, 1/04*; C10g *21/12*
U.S. Cl. 159—16S **4 Claims**

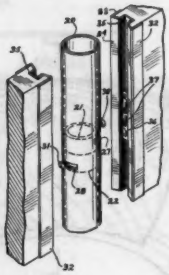
Apparatus and process for separation of an organic chemical liquid feed containing at least one thermally unstable constituent and relatively nonvolatile contaminants, to produce a vapor product having substantial freedom from relatively nonvolatile contaminants, at operating conditions below the level of thermal instability of the liquid feed. The apparatus comprises a chamber containing a fluid contacting zone, a vaporization zone above the

contacting zone, at least one conduit zone adjacent to the contacting and vaporization zones, and upper and lower fluid separation zones communicated by the conduit zone.



Preferred application of the inventive process and apparatus is in the purification of solvent compositions of the type utilized in extracting aromatic hydrocarbons from hydrocarbon mixtures.

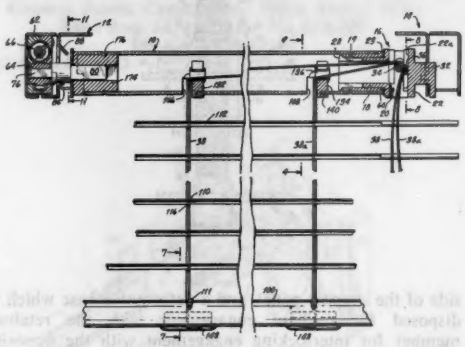
3,605,851
DIVIDER SCREEN ASSEMBLY
Robert E. Miles and Lloyd C. Mollenkopf, Bloomington, Minn., assignors to Rosemount Partitions Inc., Minneapolis, Minn.
Filed Sept. 22, 1969, Ser. No. 859,760
Int. Cl. A47g *5/00*
U.S. Cl. 160—135 **12 Claims**



A divider screen panel assembly comprising support members or columns which permit hinging of the screen panels at an infinite number of angular positions to accommodate the interior designers wishes to avoid stereotyped rectangular layouts only for interior partitions in offices and the like. The panels are made so that they will mount easily onto the support columns, and can be adjusted to the desired angular position at will. Further, the columns are made so that four panels can be supported on one column at 90° to each other. The support members permit the use of curved panels, sound proofing panels, and also have provisions for insertions of glazing strips if less than a full height of panel is desired.

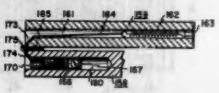
3,605,852
VENETIAN BLIND HAVING ROTATABLE HEAD ASSEMBLY
Francis Vecchiarelli, River Edge, N.J., assignor to Alcan Aluminum Corporation, Cleveland, Ohio
Filed Mar. 6, 1969, Ser. No. 804,781
Int. Cl. E06b *9/26*
U.S. Cl. 160—168 **1 Claim**

A venetian blind includes a tubular head assembly which is rotatably mounted at one of its ends in a cord lock assembly having therein a vertically movable locking pin which automatically grips and locks the cord when the latter is released after the blind has been lifted. Lift cords pass through the cord lock assembly and into the tubular head assembly and through spaced slots in the wall of the tubular head assembly. Tilt cords are attached to the head assembly. One end of the tubular



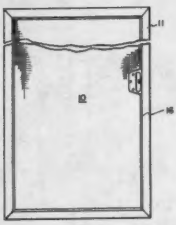
head assembly is mounted in a first mounting bracket which supports the cord lock assembly and holds it against rotation. A second mounting bracket which supports the other end of the head assembly has mounted therein a tilt gear assembly; said other end of the tubular head assembly is separably connected to the tilt gear assembly in tubular head assembly rotating relation.

3,605,853
FOLDING-DOOR CONSTRUCTIONS AND INSTALLATIONS
Norman W. Osborn, 2199 East 2875 South, Salt Lake City, Utah 84109
Filed Apr. 1, 1969, Ser. No. 811,860
Int. Cl. E06b *3/70*
U.S. Cl. 160—229R **1 Claim**



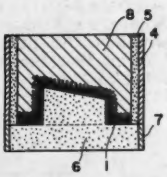
The present invention comprises specific improvements in constructions and installations of folding doors. The folding door itself is preferably spring-loaded by a spring-biased linkage at its hinged area and jamb connection to facilitate self-closing of the door. A support and travel guide assembly is included and is designed to accommodate a number of sizes of door openings to be covered by the folding-door construction. A bearing member is uniquely disposed upon a travel rod of the guide assembly in a manner so that no possibility of binding exists as the bearing member travels along its rod in accordance with door movement. Linkage between the door and the bearing member is made adjustable and extensible to accommodate various types and sizes of installations. The door itself is installed such that it does not interfere with the central door opening itself and, in a preferred form of the invention, is collapsible in a side-cavity on the adjacent wall section.

3,605,854
DOOR PULL
Henry L. Majeske, Goshen, Ind., assignor to Homeshield Industries Inc., Elmhurst, Ill.
Filed May 27, 1969, Ser. No. 828,314
Int. Cl. E06b 3/12, 3/14
U.S. Cl. 160—371 3 Claims



A screen panel unit having a handle assembly including front and rear sections between which the screen is sandwiched along edge portions of an opening provided in the screen, within an area adjoining the frame bordering said panel unit and said handle assembly occupying a position totally within the confines of planes defined by the front and rear faces of said frame.

3,605,855
PROCESS FOR THE MAKING OF METAL MOULDS FOR A CASTING
Kunii Nakata, Nagano-shi, Nagano-ken, Japan, assignor to Gonichiro Nishizawa (Governor of Nagano Prefecture), Nagano-ken, Japan
Filed Feb. 19, 1969, Ser. No. 800,681
Claims priority, application Japan, Feb. 26, 1968, 43/12,093; July 24, 1968, 43/52,287
Int. Cl. B22c 9/00
U.S. Cl. 164—23 2 Claims

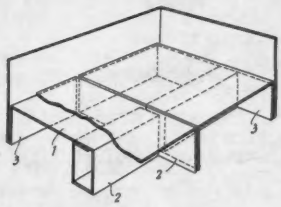


A process for making porous metal moulds characterized by moulding and solidifying material prepared by mixing and kneading metal powder and sodium silicate with metal particles as a main component on a pattern set in a moulding flask so that a shell may be formed mostly of the metal particles, removing said pattern from the moulding flask and then casting molten metal on the side of the above mentioned shell, if necessary which is arranged with exothermic agent, reverse to the pattern surface so that said shell and molten metal is made integral to make a metal mould.

3,605,856
METHOD FOR INOCULATING INVESTMENT CASTING MOLD
Lynn D. Boreland, Minerva, and George V. Ward, East Liverpool, Ohio, assignors to TRW Inc., Cleveland, Ohio
No Drawing. Filed May 22, 1969, Ser. No. 827,050
Int. Cl. B22c 9/04
U.S. Cl. 164—24 10 Claims

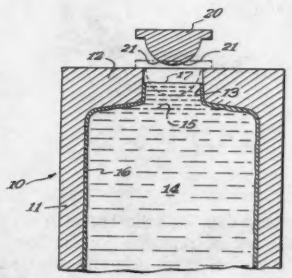
Method of forming an investment mold wherein a destructible pattern is coated with refractory particles, and a backup material is applied against the resulting coating, the backup material containing refractory particles having particles of a nucleation catalyst adhering thereto. The remainder of the mold assembly is then built up in conventional fashion and, upon completion, the pattern is removed from the mold and the mold is ready for the reception of molten metal.

3,605,857
APPLICATION OF TREATMENT AGENTS TO INGOT MOULDS
Francois Adrien Duhem, Pres-de-Sedan, France, assignor to Foseco International Limited, Birmingham, England
Filed Sept. 4, 1968, Ser. No. 757,294
Int. Cl. B22d 27/18, 27/20
U.S. Cl. 164—59 2 Claims



Molten metal may be treated during casting, e.g. to form ingots, by placing on the base of the ingot mould prior to casting a treatment agent in a combustible container, there being an air space between the treatment agent in the container and the base of the mould.

3,605,858
METHOD FOR PRODUCING A RIMMING INGOT CONTAINING A FUME-PRODUCING INGREDIENT
Robert N. Edmondson, Chesterton, and Kurt R. Mattson, Crown Point, Ind., assignors to Inland Steel Company, Chicago, Ill.
Filed Mar. 12, 1970, Ser. No. 18,953
Int. Cl. B22d 27/20
U.S. Cl. 164—57 8 Claims



Fill substantially entire bottle-top ingot mold, except neck, with molten rimming steel. Allow ingot to rim without rising in mold. Add ingredient capable of fuming (e.g., tellurium) after ingot has rimmed to the extent desired. Pour molten rimming steel into neck of mold immediately after adding fume-producing ingredient. Mechanically cap ingot, with bottom of capping element

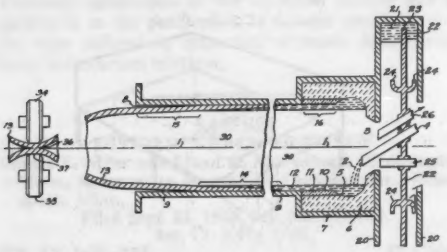
dipping into molten steel, immediately after pouring step, to seal ingot and prevent escape of fumes. Fume-producing ingredient is mixed with ingot's molten interior while fuming is minimized. Ingot has rim free of fume-producing ingredient.

3,605,859

CONTINUOUS CENTRIFUGAL TUBE CASTING WITH DRY MOLD AND GAS PRESSURE DIFFERENTIAL

George R. Leghorn, 1423 Washington Ave., Apt. 1, Santa Monica, Calif. 90403

Continuation-in-part of application Ser. No. 538,506, Feb. 11, 1966, now Patent No. 3,445,922, dated May 27, 1969. This application Oct. 21, 1968, Ser. No. 769,017
Int. Cl. B22d *11/00, 13/02, 27/16*
U.S. Cl. 164—62 13 Claims



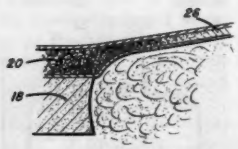
The invention relates to a rapid and improved means for the continuous centrifugal casting of metallic and non-metallic tube on the interior surface of a rotating solid-wall by utilizing novel techniques to greatly reduce the side-wall friction.

3,605,860

METHOD FOR PRODUCING SOLID BODIES FROM POWDERED MATERIAL

Eugene L. Nooker, San Luis Obispo, and George W. Galloway, Baldwin Park, Calif., assignors to G. W. Galloway Company, Baldwin Park, Calif.

Filed Dec. 4, 1968, Ser. No. 781,100
Int. Cl. B22d *23/06;* B22f *3/08*
U.S. Cl. 164—80 17 Claims



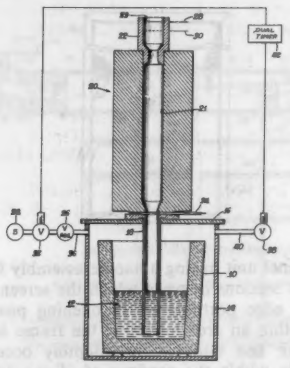
A method for producing solid bodies from powdered material by the use of explosive forces. The forces involved are of sufficient magnitude and other parameters are so chosen that complete fusion of the particles of the powdered material takes place to produce bodies of pure metal or composed of alloy or mixture compositions of types now known as well as those beyond the ranges presently available, physical properties superior to those previously known and which may be composed of metallic or of metallic and non-metallic mixtures. This is in contrast to prior art methods which use relatively low magnitudes of explosive forces to achieve only mechanical compactions.

3,605,861

MODIFYING CAST STRUCTURE

Gordon R. Lohman, Glen Ellyn, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Mar. 28, 1969, Ser. No. 811,550
Int. Cl. B22d *17/06, 27/14*
U.S. Cl. 164—119 4 Claims



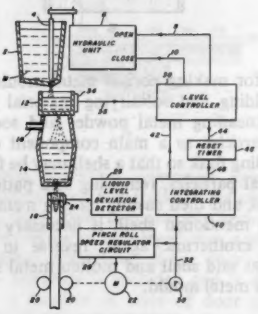
In a bottom pressure casting operation wherein molten metal is forced upward from a ladle through a pouring tube and into a mold by the application of superatmospheric pneumatic pressure to the metal, the mold is completed filled by the application of sufficient pressure to the metal, and the pressure is oscillated, in order to reduce the formation of dendrites and reduce chemical segregation in the solidifying casting.

3,605,862

SYSTEM FOR FEEDBACK CONTROL OF MOLD LEVEL IN A CONTINUOUS CASTING PROCESS UTILIZING A POUR BOX

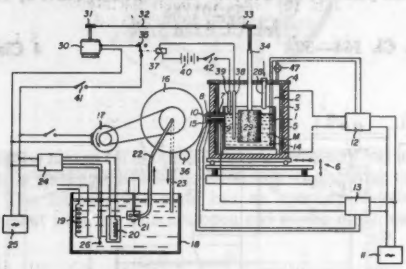
Ronald G. Schultz, Bay Village, Ohio, assignor to United States Steel Corporation

Filed May 8, 1969, Ser. No. 823,097
Int. Cl. B22d *11/10, 17/32*
U.S. Cl. 164—155 10 Claims



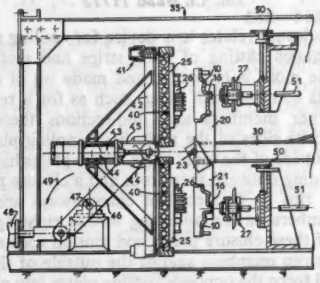
A system for controlling the mold liquid level in a continuous casting process with a pour box and a degassing vessel between a hot metal ladle and the mold. The controller cycles the pour box level within a predetermined band by opening the ladle stopper when the liquid level reaches the lower limit and closing the ladle stopper when the liquid level reaches the upper limit. The level of the band is reset each cycle according to the amount of metal cast during the previous cycle.

3,605,863
APPARATUS FOR MANUFACTURING WIRE AND THE LIKE
Derek King, Lachappele-sur-Carouge, Switzerland, assignor to The Battelle Development Corporation, Columbus, Ohio
Original application July 6, 1967, Ser. No. 651,551, now Patent No. 3,522,836, dated Aug. 4, 1970. Divided and this application Sept. 29, 1969, Ser. No. 870,880
Claims priority, application Switzerland, July 6, 1966, 9,991/66
Int. Cl. B22d *11/10*
U.S. Cl. 164—156 4 Claims



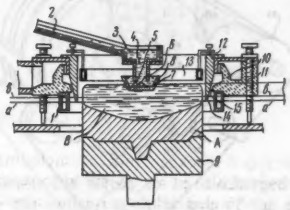
Manufacturing wire and the like by maintaining static equilibrium in molten material at the outlet of a nozzle to form a convex meniscus from which the material is continuously drawn off and solidified by means of a moving surface at constant temperature.

3,605,864
TURNTABLE SHELL MOULDING MACHINE WITH PIVOTALLY INTERCONNECTED MOULD PARTS
Jean-Pierre Bernard, 5 Avenue Valioud, Sainte-Foy les Lyon, Rhone, France
Filed Oct. 9, 1969, Ser. No. 865,092
Claims priority, application France, Oct. 10, 1968, 50,481
Int. Cl. B22c *13/08, 15/24*
U.S. Cl. 164—166 5 Claims



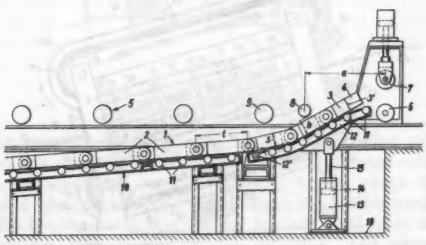
The preparation of a mould assembly for moulding or casting purposes in which the mould assembly consists of two pivotally interconnected parts movable into closed abutting relationship for moulding or casting purposes from a position in which the mould parts are in longitudinal alignment in the same plane, in which position a pattern plate having an impression in relief is inserted into the cavities of the mould parts which are approximately the same configuration as the relief impression, a space of a few millimetres being left between the pattern and the mould parts and sand being blown in to said space through the mould parts to form a skin or shell for moulding purposes. The pattern plate is preferably heated.

3,605,865
CONTINUOUS CASTING APPARATUS WITH ELECTROMAGNETIC SCREEN
Zinovy Naumovich Getselev, Prospekt Metallurgov 32, kv. 11, Kuibyshev, U.S.S.R.
Filed Dec. 23, 1969, Ser. No. 887,646
Int. Cl. B22d *11/10, 27/02*
U.S. Cl. 164—250 2 Claims



An apparatus for continuous and semicontinuous casting of metals permitting ingots to be produced without any surface defects due to the fact that a magnetic field is provided in the apparatus distributed in the axial direction so as to ensure the quality of the hydrostatic and electromagnetic pressures. This is achieved by means of an electromagnetic screen mounted within the ring-shaped inductor. The electromagnetic screen consists of a closed ring of a non-magnetic metal whose thickness increases upwardly while the lower edge is disposed at approximately half of the height of the inductor.

3,605,866
STARTER DEVICE FOR A CONTINUOUS CASTING PLANT
Otmar Kleinhagauer, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria
Filed Feb. 10, 1969, Ser. No. 797,872
Claims priority, application Austria, Feb. 12, 1968, A 1,271/68
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 4 Claims



An articulated starter bar train is adapted to be joined to the leading end of a continuously cast ingot. A first roller bed comprises rotatable rollers adapted to support

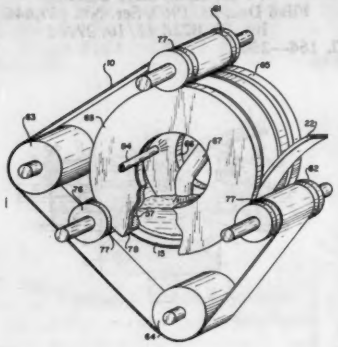
the starter bar train and the continuous casting. A second roller bed is disposed below the first roller bed. Deflecting means are provided to deflect the starter bar train from the first roller bed onto the second roller bed.

3,605,867

APPARATUS FOR CASTING METAL STRIP

Charles Christian Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed June 30, 1970, Ser. No. 51,276
Int. Cl. B22d *11/06*
U.S. Cl. 164—278 18 Claims



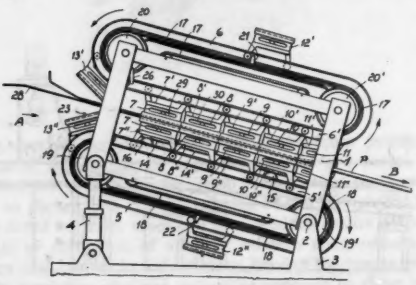
Apparatus for continuously casting metal strip on a continuously cooled moving belt includes means around which the belt is trained to form a small dependent loop within a larger loop, and end pieces that cooperate with the small loop to make a reservoir into which molten metal is teemed and in which it solidifies against the inside surface of the belt.

3,605,868

MACHINE FOR THE CONTINUOUS CASTING OF MOLTEN MATERIALS IN IRON MOLDS OR CHILLS

Massimo Giadorou, Via priv. C. Battisti 1, Milan, Italy

Filed Feb. 16, 1970, Ser. No. 11,551
Claims priority, application Italy, Feb. 24, 1969, 13,247/69
Int. Cl. B22d *11/06*
U.S. Cl. 164—279 9 Claims



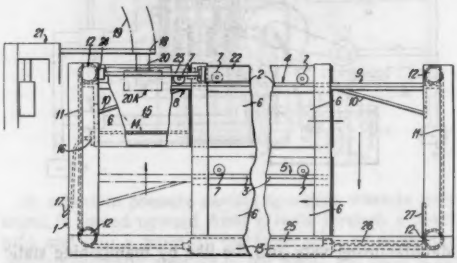
A machine for the continuous casting of molten material into an elongated cooling composite mold cavity for obtaining a continuous bar formation from said material, the machine comprising a plurality of movable composable chills having at least two removably mating chill parts defining a longitudinal section of said elongated mold cavity when in mating position, and guide means for said mating chill parts.

3,605,869

SUPPORT MEANS FOR CERAMIC SHELL MOULDS

Roland P. Chapman, Redditch, and Barry F. Irving, Highley, England, assignors to British Leyland (Austin-Morris) Limited (formerly The British Motor Corporation Limited), Longbridge, Birmingham, England

Filed Oct. 22, 1969, Ser. No. 868,528
Claims priority, application Great Britain, Nov. 9, 1968, 53,201/68
Int. Cl. B22d *5/04*
U.S. Cl. 164—324 4 Claims



A ceramic shell mold is partially immersed in a fluidized bed of granular refractory material. The bed is then defluidized so that the shell mold is firmly embedded in readiness to receive a charge of molten metal.

3,605,870

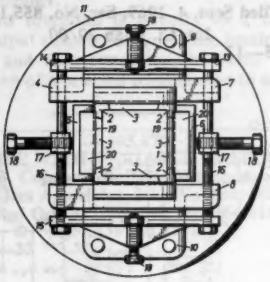
COOLING DEVICE FOR CONTINUOUS CASTING MOLDS

Heribert Krall, Wurzburg, and Hans Adalbert Koch, Hochberg, Germany, assignors to Technica-Guss G.m.b.H., Wurzburg, Germany

Filed Oct. 18, 1968, Ser. No. 768,858
Claims priority, application Germany, Apr. 26, 1968, T 24,030, Patent 1,993,120
Int. Cl. B22d *11/12*
U.S. Cl. 164—283 2 Claims

The disclosure relates to a device for cooling molds for the continuous casting of bars, strips and sections with edges. The mold is elongated and made up of elongated mold parts abutting each other, such as for a rectangular mold corner members and mid-sections therebetween. Two opposite sides of the mold have cooling plates abutting the outside of the mold parts. These plates have spaced ribs extending outward therefrom and a closure plate rests upon the ribs so that coolant channelways are formed. Strap members having adjusting screws right against the outside of these closure plates and tension rods secure the opposite strap members against the outside of the closure plates and force the opposite cooling plates into close abutting contact with the outside of the adjacent mold members. The other opposite two outsides of the mold members each have an elongated U-shaped plate member with its legs resting against the outside of the adjacent opposite mold members. A sleeve is received on each tension rod adjacent the outside of the U-shaped cooling plates and a screw is threadedly received in a threaded aperture in each sleeve and presses against the outside of the bight portion of the U-shaped coolant plate to urge the legs thereof into engagement with the adjacent mold members.

The elongated space formed between the U-shaped member and the outside of the adjacent mold member serves as a passageway for coolant. The first two mentioned cooling plates have in line transverse flanges that serve as



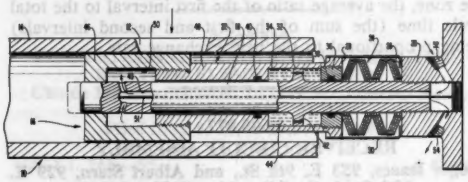
mounting means for mounting the assembly onto an intermediate plate attached to the furnace at its discharge opening. The intermediate plate has an aperture therein in alignment with the adjacent open end of the mold assembly.

3,605,871

DIE CASTING MACHINE INCLUDING SEQUENTIALLY ACTING COMPOUND PISTON ASSEMBLY MACHINE

Richard K. Whitehead, Sr., 1631 Northgate Wood Road NE. 30329; Richard K. Whitehead, Jr., 2044 Breckenridge Drive NE. 30324; and Harry C. Whitehead, 2585 Circle Wood Road NE. 30329, all of Atlanta, Ga.

Filed May 1, 1969, Ser. No. 820,869
Int. Cl. B22d *17/10, 27/12*
U.S. Cl. 164—319 6 Claims



The piston assembly of a die casting or plastic injection machine includes inner and outer concentric pistons. The inner piston is directly driven while the outer piston is driven through the medium of a stack of conical washers so that when the metal or plastic being cast attains a predetermined pressure, the washers collapse and arrest motion of the outer piston while the inner piston continues to move, greatly increasing the internal pressure at final chilling.

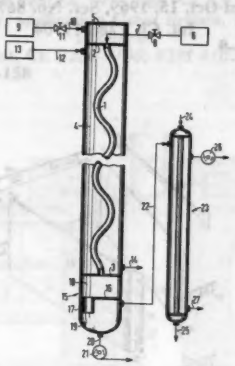
3,605,872

METHOD OF CAUSING A LIQUID TO FLOW IN A STREAM OF ANNULAR CROSS SECTION

Jacques Brault, Neuilly-sur-Seine, France, assignor to Wiegand Apparatebau G.m.b.H., Karlsruhe, Germany

Filed Aug. 11, 1969, Ser. No. 849,620
Claims priority, application France, Aug. 15, 1968, 12,295
Int. Cl. F28d; B01d *1/22*
U.S. Cl. 165—1 16 Claims

When a liquid and a gas are passed continuously through a helical heat exchanger conduit spiraling about a vertically extending axis, the liquid is forced against the wall of the conduit and the gas occupies the center of the tube if the flow rates of the liquid and gas are con-



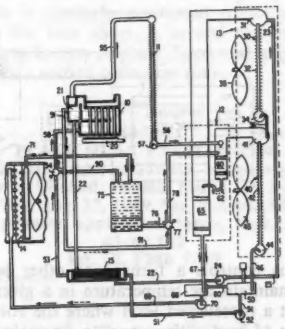
trolled to permit the liquid to be discharged from the conduit over the entire circumference of the exit orifice of the conduit. High heat transfer coefficients are obtained thereby between the liquid and the conduit wall.

3,605,873

HEATING AND COOLING SYSTEM

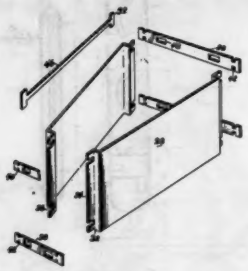
Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,655
Int. Cl. F25b *15/06*
U.S. Cl. 165—2 11 Claims



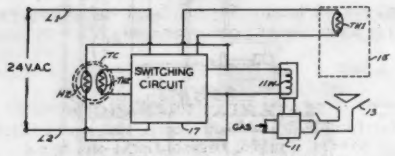
An absorption refrigeration system is provided with an excess quantity of octyl alcohol heat exchange additive. A separation tank is provided which stores the alcohol when the system is operating in the cooling mode. In the heating mode, the alcohol is discharged from the separation tank, heated in the generator, and passed through an air-conditioning coil to provide heating to a desired location. Means are provided for mixing absorbent solution and refrigerant to form a dilute mixture which will not freeze when stored in the system during heating mode operation.

3,605,874
ELEMENT BASKET
Richard L. Brunell, Scio, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Oct. 15, 1969, Ser. No. 867,984
Int. Cl. F28d 19/04
U.S. Cl. 165—9 2 Claims



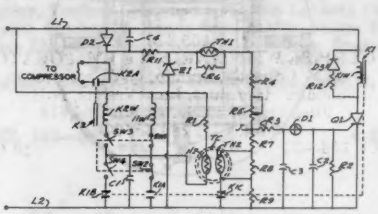
A basket for a mass of heat absorbent element contained in a rotor of a rotary regenerative heat exchanger. The basket is comprised of uniformly sized components that may be readily formed and stockpiled, and easily assembled into an effective container for the element.

3,605,875
ELECTROTHERMAL TIME PROPORTIONING TEMPERATURE CONTROL
Lyle E. McBride, Jr., Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sept. 4, 1969, Ser. No. 855,143
Int. Cl. F25b 29/00
U.S. Cl. 165—12 8 Claims



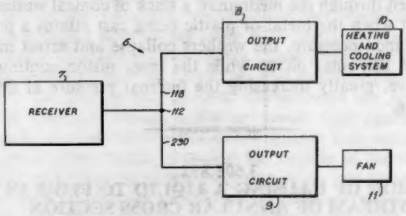
Apparatus controls a furnace or other heat transfer means to maintain the temperature in a given zone substantially at a preselected level where the zone is subject to exchange of heat with respect to an environment at a variable rate tending to cause substantial change in temperature therein from this preselected level. First and second thermistors are provided, the first sensing the temperature in the zone and the temperature of the second being substantially independent of the temperature in the zone. A heater is provided which is energized concomitantly with energization of the furnace to cause heating of the second thermistor. A switching circuit interconnected with the thermistors is operative as means for repetitively energizing and deenergizing the furnace for respective first and second time intervals varying as a function of the temperature in the zone, the average ratio of the first interval to the total cycle time (the sum of the first and second intervals) being proportional to the heat exchange rate.

3,605,876
ELECTROTHERMAL TIME PROPORTIONING TEMPERATURE CONTROL
David J. Squiers, Attleboro Falls, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sept. 4, 1969, Ser. No. 855,179
Int. Cl. F25b 29/00
U.S. Cl. 165—12 7 Claims



Apparatus controls a furnace or other heat transfer means to maintain the temperature in a given zone substantially at a preselected level where the zone is subject to exchange of heat with respect to an environment at a variable rate tending to cause substantial change in temperature therein from this preselected level. An SCR is connected for energizing the furnace when the SCR is triggered. First and second thermistors are provided, the first sensing the temperature in the zone and the temperature of the second being substantially independent of the temperature in the zone. A heater is provided which is energized concomitantly with energization of the furnace to cause heating of the second thermistor. A triggering circuit for the SCR is interconnected with the thermistors and triggers the SCR to repetitively energize and deenergize the furnace for respective first and second time intervals varying as a function of the temperature in the zone, the average ratio of the first interval to the total cycle time (the sum of the first and second intervals) being proportional to the heat exchange rate.

3,605,877
RECEIVER CIRCUIT ASSEMBLY
Roger Isaacs, 953 E. 9th St., and Albert Stern, 929 E. 18th St., both of Brooklyn, N.Y. 11230
Filed June 26, 1969, Ser. No. 836,860
Int. Cl. F25b 29/00
U.S. Cl. 165—26 82 Claims

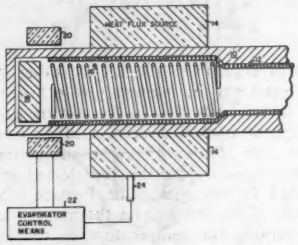


The present invention pertains to an RF receiver circuit assembly and more particularly to a receiver operatively associated with remote controlled heating and cooling systems having fans and adapted to demodulate a complex RF signal having an RF component, a mid-range audio frequency component and a low frequency

component and including associated output circuits operatively connected to the receiver which are responsive to the low frequency component to selectively activate said heating and cooling systems and the fans in a predetermined manner.

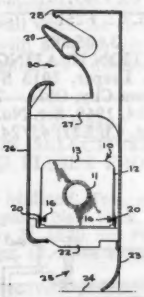
The present invention is directed to a receiver and associated output circuits for activating heating and cooling systems and fans connected therewith in response to the reception of a selected transmission to said receiver.

3,605,878
HEAT PIPE WITH VARIABLE EVAPORATOR
John B. Coleman, Buffalo, N.Y., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Oct. 8, 1969, Ser. No. 864,619
Int. Cl. F28d *15/00*
U.S. Cl. 165—32 **10 Claims**



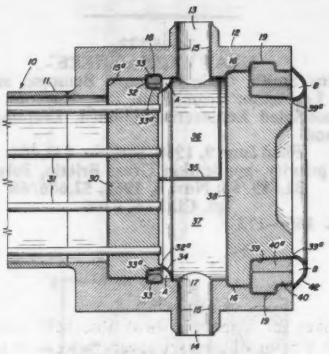
A heat pipe is provided with means in the evaporator section for reducing the effective capillary pore diameter of that portion of the wick. The effective size of the pores in the evaporator wick are varied in response to an external signal and the pressure differential which drives the circulating fluid is thereby controlled.

3,605,879
PLASTIC CORNER RAIL AND FIN-AND-TUBE HEATING ELEMENT ASSEMBLY
Claude William Schaefer, Jr., 119 St. Dunstans Road, Baltimore, Md. 21212
Filed May 8, 1970, Ser. No. 35,837
Int. Cl. F24h *9/08*
U.S. Cl. 165—55 **4 Claims**



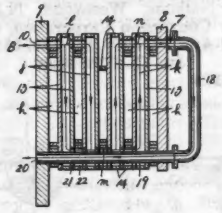
A fin-and-tube heat exchanger for baseboard radiators and the like wherein the fins have laterally opening undercut notches or recesses at their lower corners. Plastic corner rails having a thin slat-like, vertically oriented body portion are assembled to the fins alongside their lower corners by pairs of integral flexible fish hook formations which fit into and are retained in the notches.

3,605,880
PRESSURE VESSELS
Colin Smith, Upper Warlingham, England, assignor to The Lummus Company, Bloomfield, N.J.
Filed Feb. 24, 1970, Ser. No. 13,377
Claims priority, application Great Britain, Feb. 25, 1969, 10,096/69
Int. Cl. F23d *7/06*; F28f *9/02*
U.S. Cl. 165—158 **6 Claims**



A closure assembly for pressure vessels, such as boilers, heat exchangers and autoclaves wherein at least two mediums are passed in heat exchange relationship thereto and wherein each medium is under a separate pressure whereby the differential may be of relatively high magnitude. A tube sheet is positioned within the end closure member of the vessel on a shoulder portion thereof. A retaining ring assembly is inserted into the closure member and cooperates with a shouldered portion on the tube sheet to restrain the latter within the closure member. A collection ring is thereafter affixed about the retaining ring assembly to form a collection zone. Laterally spaced apart from said tube sheet, to form an inlet zone with an inlet conduit provided in said closure member, is a cover which is similarly positioned within said closure member as the tube sheet. A second retaining ring assembly and collection ring are fitted and affixed, respectively to form a second collection zone.

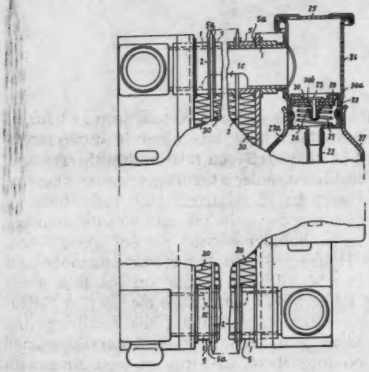
3,605,881
PLATE HEAT EXCHANGER
Masafumi Doi, Daito-shi, Japan, assignor to Hisaka Works, Limited, Higashi Osaka-shi, Japan
Filed Aug. 27, 1969, Ser. No. 853,366
Claims priority, application Japan, Sept. 5, 1968, 43/64,122
Int. Cl. F28b *3/00*
U.S. Cl. 165—167 **5 Claims**



In a multiple-pass heat exchanger, a fluid passageway of double-pipe construction is provided, having a through passage extending through a main support frame, a plurality of plates and a rear support frame which are laminated and clamped together and other passages, preferably concentric or complementary to the through passage,

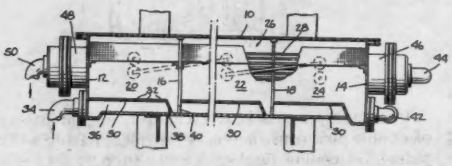
for establishing the series connections of the multiple-pass relation, it being so arranged that a fluid passing through a fluid channel on the multiple-pass side is led to the rear end of said fluid passageway and is withdrawn from the front surface of said main support frame through said fluid passageway. Or, the fluid is supplied from said fluid passageway and withdrawn from the front surface of the main support frame through the channel on the multiple-pass side.

3,605,882
HEAT EXCHANGERS
Peter Roy Smith, Colin Raymond Bemrose, and Henry John Levington, Leamington Spa, England, assignors to Associated Engineering Limited, Leamington Spa, England
Filed June 9, 1969, Ser. No. 831,404
Claims priority, application Great Britain, July 2, 1968, 31,589/68; Nov. 6, 1968, 52,686/68
Int. Cl. F28f *9/00*
U.S. Cl. 165—173 4 Claims



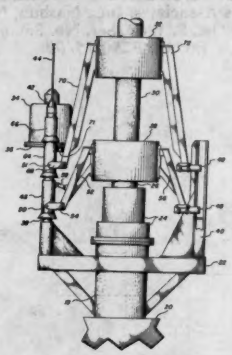
This invention relates to heat exchangers comprising at least one manifold tube interconnecting a plurality of passage members through which a liquid can flow, wherein the manifold tube passes through apertures in the walls of the passage members and is constructed to allow for liquid flow between the manifold tube and the passage members. The passage members and manifold tube are secured together by means of surrounding members affixed to both the manifold tube and passage members. The invention also discloses features of an expansion container connected to the manifold.

3,605,883
HEAT EXCHANGER
Robert Louis Nalbone, Westwood, N.J., assignor to Saline Water Conversion Corporation, Oradell, N.J.
Filed Apr. 25, 1969, Ser. No. 819,169
Int. Cl. F28f *9/14*
U.S. Cl. 165—178 1 Claim



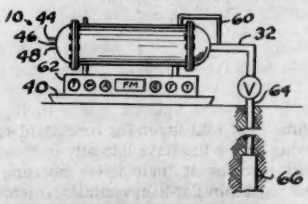
A heat exchanger having a tube configuration with a uniform inside diameter and periodically placed thickened sections which serve to eliminate the requirement of sealing devices between tubes and the divider plates of a multistage evaporator, thereby serving as a seal between adjacent stages.

3,605,884
SINGLE GUIDELINE SYSTEM
Walter Brown, Long Beach, Calif., assignor to North American Rockwell Corporation
Filed June 25, 1969, Ser. No. 836,372
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 12 Claims



The disclosed system for emplacing equipment under water employs the combination of an orienting bushing mounted on a guide sleeve that is adapted to travel down a flexible guideline and which cooperates with a guide key mounted on a guide pin that is fixedly positioned to one side of a connector on a subaqueous bottom mounted structure. The relatively coarse adjustment provided by the orienting bushing enables the use of a fine adjustment that is achieved by a radial cylindrical extension fitting into an upwardly tapered slot that is fixedly positioned on the bottom structure at a known orientation relative to the bottom connector and to the bottom guide pin. As structure to be connected at the bottom is lowered into position the orienting bushing operates first to produce a coarse orientation which then allows mating of the radial extension and tapered slot to provide a fine adjustment of the equipment that is to be emplaced.

3,605,885
EARTH FORMATION HEATING APPARATUS
Johnnie L. Leeper, 1013 SW. 57th, Oklahoma City, Okla. 73109
Filed July 14, 1969, Ser. No. 841,390
Int. Cl. E21l *43/24*
U.S. Cl. 166—57 2 Claims



A double walled insulated combustion chamber having fuel inlet ports and a heated gas exhaust port has its exhaust port connected to tubing extending into a well

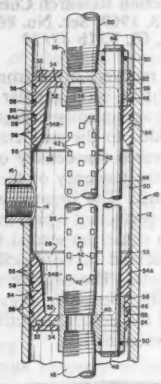
bore. Water received by a jacket surrounding the combustion chamber is converted to steam and injected into the flow of heated gases down stream from the exhaust port. Pressure generated by combustion forces the heated gases and steam into the well bore for heating pipe and earth formations.

3,605,886

DISTRIBUTION UNIT FOR PITLESS WELLS

Edward A. Cox, Lake Zurich, and Conrad R. Medina, Des Plaines, Ill., assignors to Clayton Mark and Company, Evanston, Ill.

Filed Aug. 29, 1969, Ser. No. 854,243
Int. Cl. F21b *23/00, 33/03*
U.S. Cl. 166—89 **10 Claims**



A distribution unit for use within a well casing of a pitless well installation serves to establish a pressure isolated chamber intercommunicating the drop pipe of the well with a lateral discharge outlet. The unit includes a pair of end supports held in spaced relation by a perforated conduit, each support carrying a packer engageable in sealing relation with the well casing. One end support is engageable with a hanger pipe for suspending the unit at the level of the discharge outlet, and the other end support is engageable with the drop pipe for introducing fluid through the conduit perforations into the chamber defined between the packers. Each packer includes a flexible resilient sleeve expandable into sealing engagement against the casing wall when the chamber is subjected to pressure, together with an outer rib structure providing a seal when the chamber is subjected to vacuum.

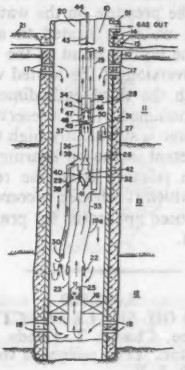
3,605,887

APPARATUS FOR SELECTIVELY PRODUCING AND TESTING FLUIDS FROM A MULTIPLE ZONE WELL

Darryl A. Lambie, Midland, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,340
Int. Cl. E21b *43/00*
U.S. Cl. 166—105 **7 Claims**

Apparatus for selectively producing and testing fluids from a multiple zone well including a packer sealing off one of the zones from another and a tubing string in fluid communication with the lower zone. A lower zone cross-over is disposed above the packer in fluid communication with the tubing string for diverting fluids from the lower zone and into the annulus between the tubing string and the well. An upper zone fluid inlet is in fluid communication with the tubing string above the lower zone cross-over. A pump extension is selectively movable in the tubing string between a position sealing off the tubing string at one point above the lower zone cross-over and below the upper zone fluid inlet and at another point below both the lower zone crossover and the upper zone fluid inlet. The pump extension includes a first normally open fluid inlet for removing fluids from both of the zones and a second normally closed fluid inlet for removing fluids from the lower zone.

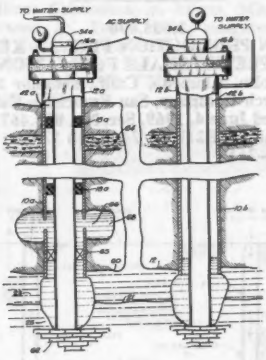


3,605,888

METHOD AND APPARATUS FOR SECONDARY RECOVERY OF OIL

Fred L. Crowson, Portland, and William G. Gill, Corpus Christi, Tex., assignors to The Electrothermic Co., Corpus Christi, Tex.

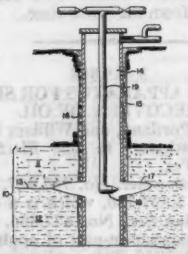
Division of application Ser. No. 767,917, Sept. 30, 1968, now Patent No. 3,507,330, which is a continuation-in-part of application Ser. No. 677,836, Oct. 16, 1967, which is a continuation-in-part of application Ser. No. 449,077, Apr. 19, 1965. This application Oct. 21, 1969, Ser. No. 870,006
Int. Cl. E21b *43/20, 43/24*
U.S. Cl. 166—248 **21 Claims**



There is disclosed in the specification and drawings a method for secondary recovery of oil in which electrical current is caused to flow through water in the bottom of a bore hole to produce heating of the water. Sufficient

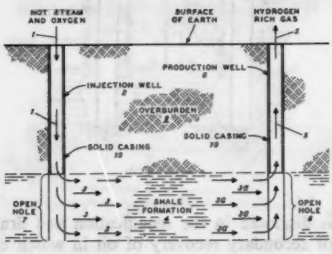
pressure is maintained on the water as the water is heated to prevent boiling of the water at temperatures substantially in excess of the boiling point of water at the surface of the bore hole. In accordance with one embodiment of the invention, water is injected into the strata to produce a water flood. The water which is injected is heated by the flow of electrical current such that a hot water flood is provided. In accordance with the second embodiment of the invention, the pressure on the water is periodically relieved when the water is heated to a temperature at least as great as the boiling point of the water at the surface to permit conversion of the heated water into steam. In accordance with the third embodiment of the invention, the water is contained within a reservoir until the temperature of the water is sufficiently high to produce steam at the pressure present in the oil bearing strata the water and steam is then released from the reservoir into the strata. The water which is released is converted into steam. There is also disclosed apparatus for practicing the method of the invention.

3,605,889
ETCHED OIL SHALE FRACTURING
Philip J. Closmann, Charles T. Deeds, and Monroe H. Waxman, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.
Filed May 13, 1970, Ser. No. 36,856
Int. Cl. E21b *43/27*
U.S. Cl. 166—254 **7 Claims**



A method for forming substantially horizontal fractures in a subsurface oil shale formation by chemically generating a substantially horizontal plane of weakness and then hydraulically extending a fracture into this plane of weakness.

3,605,890
HYDROGEN PRODUCTION FROM A KEROGEN-DEPLETED SHALE FORMATION
Melvin M. Holm, Alameda, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed June 4, 1969, Ser. No. 830,467
Int. Cl. E21b *43/24*; C10b *57/20*
U.S. Cl. 166—261 **6 Claims**



A process for producing a hydrogen-rich gas which comprises injecting steam into a kerogen-depleted shale formation through an injection well; contacting the steam with carbonaceous matter in the shale formation at a temperature between about 600° F. and 1,100° F. to obtain a hydrogen-rich gas, at a temperature between about 600° F. and 1,100° F. and with a relatively small amount of CO in the hydrogen-rich gas, the CO_2 to CO ratio being at least 2.5; and withdrawing the hydrogen-rich gas from the shale formation through a production well; said kerogen-depleted shale formation having a volume of at least ½ million cubic feet of kerogen-depleted shale.

3,605,891
OIL RECOVERY PROCESS BY MISCIBLE DISPLACEMENT
Robert C. Ayers, Jr., Houston, Tex., assignor to Esso Production Research Company
Filed Mar. 3, 1969, Ser. No. 803,702
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **5 Claims**

In a process for the recovery of oil from a subterranean formation using as a first bank a polar organic solvent and as a second bank an aqueous surfactant solution, an organic additive is added to the surfactant solution. The organic additive decreases the density of the surfactant solution and reduces the tendency of the second bank to underride the first bank. The organic additive also decreases the amount of surfactant which must be employed in the second bank to cause the second bank to miscibly displace the first bank and to be miscibly displaced by the following flood water. The organic additive must be highly soluble in both the polar organic solvent and water. The density of the organic additive should be approximately that of water or less.

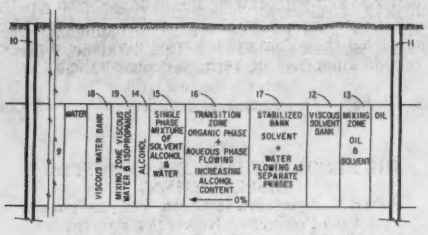
3,605,892
IMPARTING IN SITU STABILITY TO DISPLACING FLUIDS
William B. Gogarty and Richard W. McAtee, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
No Drawing. Filed Oct. 29, 1969, Ser. No. 872,348
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **24 Claims**

An improved process of recovering hydrocarbon from a hydrocarbon-bearing subterranean fomation having at least one injection means in fluid communication with at least one production means and wherein a flooding agent (e.g. a miscible-type) is injected into the formation followed by the injection of a displacing fluid containing a mobility reducing agent and the displacing fluid followed by a drive fluid to displace the flooding agent and displacing fluid toward the production means to recover crude oil therethrough, the improvement comprising incorporating into a mini-slug of the displacing fluid relatively high concentrations of the mobility reducing agent. For example, 1–20 percent formation pore volume of a micellar dispersion is followed by 0.1–20% formation pore volume of a displacing fluid containing 50–100,000 p.p.m. of the mobility reducing agent and this, in turn, followed by drive water.

3,605,893
SECONDARY RECOVERY PROCESS
Dwight L. Dauben, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.
Filed Nov. 28, 1969, Ser. No. 880,578
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **5 Claims**

Oil is recovered from an underground oil-bearing formation by injecting into the formation in sequence three batches or slugs of liquid. These are first a liquid

hydrocarbon; second, a mutual solvent for the liquid hydrocarbon and water; and, third, water with increased viscosity. The final slug is followed by ordinary drive water. The viscosities of the viscous water slug and hydrocarbon liquid are increased to values at least as great


WATER
VISCOUS WATER BANK
MIXING ZONE VISCOUS WATER & ISOPROPANOL
ALCOHOL
SINGLE PHASE MIXTURE OF SOLVENT ALCOHOL & WATER
TRANSITION ZONE ORGANIC PHASE + AQUEOUS PHASE FLOWING INCREASING ALCOHOL CONTENT
0%
STABILIZED BANK SOLVENT + WATER FLOWING AS SEPARATE PHASES
VISCOUS SOLVENT BANK
MIXING ZONE OIL & SOLVENT
OIL

as the viscosity of the mutual solvent. Preferably, the hydrocarbon liquid is propane or butane with viscosity increased by the addition of a solution of polyisobutylene in a hydrocarbon having a higher molecular weight than butane.

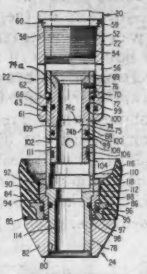
3,605,894
IMPARTING IN SITU STABILITY TO DISPLACING FLUIDS
Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
No Drawing. Continuation-in-part of application Ser. No. 693,103, Dec. 26, 1967, now Patent No. 3,520,366. This application Oct. 29, 1969, Ser. No. 872,397
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **13 Claims**

A secondary-type recovery process wherein crude oil is recovered from a subterranean formation by displacing therethrough a displacing fluid comprised of electrolyte and/or semi-polar compound is improved by injecting into the formation before the displacing fluid an aqueous pre-slug containing a preferably water soluble semi-polar compound or electrolyte and the preferably water soluble semi-polar compound. Examples of displacing fluids include water- and oil-external emulsions, and water- and oil-external micellar dispersions and miscible-type fluids. A mobility buffer slug can follow the displacing fluid and the displacing fluid and mobility buffer can be displaced through the formation by a drive fluid which can be substantially hydrocarbon or aqueous.

3,605,895
IMPARTING IN SITU STABILITY TO DISPLACING FLUIDS
Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
No Drawing. Continuation-in-part of application Ser. No. 693,103, Dec. 26, 1967, now Patent No. 3,520,366. This application Oct. 29, 1969, Ser. No. 872,405
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **13 Claims**

A secondary-type recovery process wherein crude oil is recovered from a subterranean formation by displacing therethrough a displacing fluid comprised of electrolyte and semi-polar organic compound or semi-polar organic compound is improved by injecting into the formation before the displacing fluid a pre-slug containing electrolyte and semi-polar compound. Examples of displacing fluids include water- and oil-external emulsions, and water- and oil-external micellar dispersions and miscible-type fluids; examples of preslugs include preferably aqueous fluids but also include those which are substantially hydrocarbon. A mobility buffer slug can follow the displacing fluid. The displacing fluid and the mobility buffer can be displaced through the formation by a drive fluid which can be substantially hydrocarbon or aqueous.

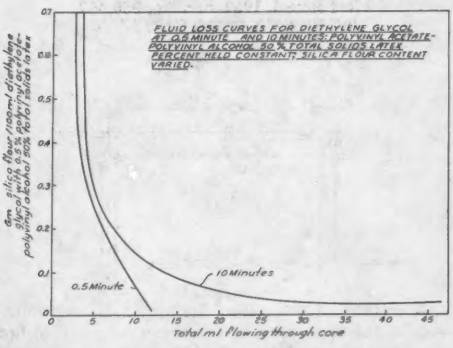
3,605,896
LINER TOP SQUEEZE PLUG BELOW RETRIEVABLE TOOL
Lee E. Perkins, Houma, La., assignor to Halliburton Company, Duncan, Okla.
Filed June 4, 1969, Ser. No. 830,462
Int. Cl. E21b *33/16*
U.S. Cl. 166—290 **10 Claims**



An annular liner plug is releasably mounted on the lower end of a well bore cementing string by means of a ball-type retaining and releasing device. A releasing plug is pumped down the cementing string, following the cement used to cement a liner within the well bore, and forceably engages within slidable socket member within the annular liner plug. Hydrostatic pressure on the releasing plug results in the shearing of an attachment means connecting the slidable socket with the interior of the annular liner plug. The socket member slides downward, under the force of the releasing plug and permits the ball device to operate so as to release the annular liner plug from the cementing string.

The liner plug is pumped downward and, ultimately, seats over the liner at the bottom of a well bore. The liner plug operates to seal off an annular gap between the liner top and a surrounding casing. The releasing plug, engaged within the socket member of the annular liner plug, now operates to seal off the cement below this assembly from the fluid disposed above this assembly. Latching means may be provided for retaining the releasing plug within the annular liner plug against abrupt back pressures or well "kicking."

3,605,897
WELL TREATMENT METHOD USING FLUID-LOSS CONTROL AGENT FOR GLYCOLS
Oliver William Crinkelmeyer, Biloxi, Miss., and Edwin N. Alderman, Jr., Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 3, 1968, Ser. No. 780,778
Int. Cl. E21b *33/13*
U.S. Cl. 166—291 **5 Claims**


FLUID LOSS CURVES FOR DIETHYLENE GLYCOL AT 0.5 MINUTE AND 10 MINUTES; POLYVINYL ACETATE-POLYVINYL ALCOHOL 50 % TOTAL SOLIDS LATEX PERCENT HELD CONSTANT; SILICA FLOUR CONTENT VARIED.
0.5 Minute
10 Minutes
Total ml Flowing through core

(1) A composition of matter having low fluid-loss through pores, cracks and small openings in solid surfaces

in contact therewith comprising a polyalcohol (e.g., glycols or polyglycols), silica fluor, and polyvinyl acetate-polyvinyl alcohol polymer and (2) use therefor in well treatments and cooling systems wherein a glycol or polyglycol is employed.

3,605,898

METHOD OF DRILLING AND CEMENTING A WELL USING AN AQUEOUS HYDRAULIC CEMENT SLURRY

Hugh T. Harrison, Tulsa, and Korwin J. Goodwin, Enid, Okla., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 29, 1968, Ser. No. 748,173
Int. Cl. E21b *21/04, 33/14*
U.S. Cl. 166—293 **4 Claims**

An improved aqueous hydraulic cement slurry which may be retained in a pumpable fluid state for an indefinite time (and accordingly used as a well-drilling circulating fluid) by admixture therewith of a heptolactone, particularly D-gluco-D-guloheptolactone, and just prior to ultimate emplacement of the slurry containing the additive, admixing therewith a polyvalent metal salt accelerator to the setting rate, e.g. $CaCl_2$.

3,605,899

METHOD OF INCREASING PERMEABILITY OF CEMENT PACKS

Jack F. Tate and Thomas E. Sample, Jr., Houston, Tex., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,973
Int. Cl. E21b *43/27*
U.S. Cl. 166—300 **14 Claims**

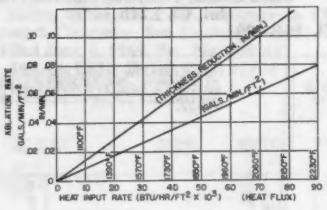
Permeability of a cement pack containing acid-soluble materials in a wellbore traversing a producing formation is improved by the controlled generation in situ of a halogenated acid whereby acid-soluble materials accumulated at the pack face and within the cement pack are dissolved and the flow of fluids therethrough is facilitated, without substantially weakening the mechanical strength of the cement pack.

3,605,900

METHOD OF CONTROLLING FIRE

William L. Livingston, Sharon, and Russell W. Pierce, Hanover, Mass., assignors to Factory Mutual Research Corporation, Boston-Providence Turnpike, Mass.

Filed Oct. 10, 1968, Ser. No. 766,475
Int. Cl. A62c *1/00*
U.S. Cl. 169—1A **12 Claims**



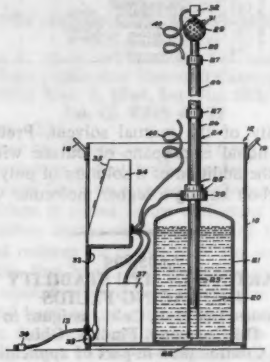
A method of controlling fire within an enclosure involving the application to the object subjected to fire of a coating of an ablative fluid to form a layer of sufficient thickness so that the layer possesses ablative properties, said coating being applied from an automatically operable fixed source in a substantially continuous stream in sufficient quantity to maintain said layer at said sufficient thickness.

3,605,901

FIRE PROTECTION APPARATUS

George J. Grabowski, Needham, William B. Osborne, Marlboro, and Rexford Wilson, Framingham Centre, Mass., assignors to Fenwal, Inc., Ashland, Mass.

Filed Oct. 28, 1968, Ser. No. 770,926
Int. Cl. A62c *35/00*
U.S. Cl. 169—2R **11 Claims**



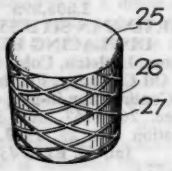
A completely automatic fire protection system is disclosed comprising battery powered, portable suppressor units each including a supply of fire extinguishing fluid and a fire detector. Connection of the individual unit's control circuits provides a control circuit network that automatically initiates extinguishing fluid discharge from all units in response to fire detection by any single unit.

3,605,902

REINFORCED FUSIBLE ELEMENT

Wayne E. Ault, Aurora, Ohio, assignor to A-T-O Inc., Cleveland, Ohio

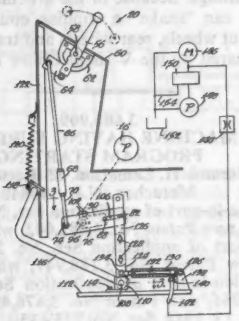
Filed Mar. 11, 1969, Ser. No. 806,123
Int. Cl. A62c *37/30*
U.S. Cl. 169—42 **1 Claim**



A reinforced fusible element useful in fire extinguishing sprinklers, fusible links on fire doors and the like is disclosed wherein the fusible material usually solder of a lead alloy or the like is provided with reinforcing means for stabilizing its size and shape by acting to prevent cold flow of the alloy as a result of compressive or tension forces thereagainst. Specifically a fusible element may be provided with reinforcing fibers of suitable materials including natural fibers, synthetic fibers and metal fibers or fine strands may be mixed into the alloy so as to be disposed continuously therethrough and still another version encloses a section of fusible material in a woven jacket

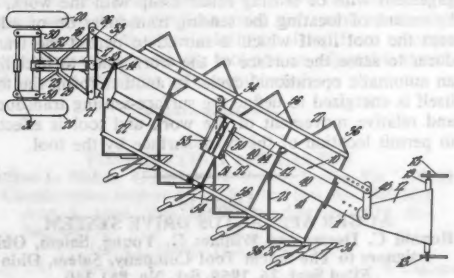
engaging the surface area of the fusible material that would ordinarily expand when the same is subjected to compressive forces, etc.

3,605,903
SPEED CONTROL SYSTEM FOR A VEHICLE
Herbert C. Glesmann, Omaha, Nebr., assignor to Omsteel Industries, Inc.
Filed July 25, 1969, Ser. No. 844,892
Int. Cl. A01b *67/00*
U.S. Cl. 172—3 14 Claims



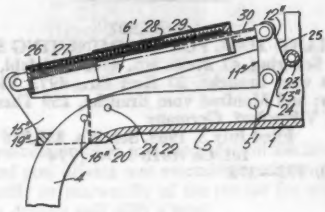
A speed control system for a vehicle including manually operable control means for a variable speed drive and settable to a plurality of positions corresponding to a plurality of different ground traversing speeds, and override means operative to temporarily override the manual control to alter the speed of the vehicle without changing the setting of the manually operable control. In one form of the invention, the override means comprises a manually actuable operator while in another, sensing means are provided to sense when a work performing means requires more time to perform a given job to thereby decrease the rate of speed of the vehicle.

3,605,904
AGRICULTURAL PLOUGHS
Roger Hugh Rutterford, 7 St. James St., King's Lynn, Norfolk, England
Filed Apr. 30, 1969, Ser. No. 820,502
Claims priority, application Great Britain, May 3, 1968, 21,061/68
Int. Cl. A01b *3/16, 3/44*
U.S. Cl. 172—212 3 Claims



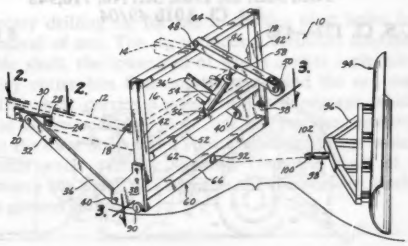
A reversible plough has two sets of plough bodies mounted on a beam structure, the rear end of which is mounted on steerable depth control wheels mounted on a bogey, the steering of the plough being achieved by the superimposed effects of angling the bogey with respect to the plough beam and angling the wheels with respect to the bogey frame.

3,605,905
AGRICULTURAL IMPLEMENTS
Isak T. Bo, Randaberg pa Jaeren, Norway, assignor to Kyllingstad Plogfabrik A/S, Kleppe, Norway
Filed Jan. 8, 1969, Ser. No. 789,911
Claims priority, application Norway, Jan. 9, 1968, 80/68; Apr. 5, 1968, 1,335/68, 1,336/68
Int. Cl. A01b *61/00, 35/24*
U.S. Cl. 172—265 2 Claims



A hinged pressure releasable connecting means is provided to join the frame of an agricultural implement to the beam which supports the implement. The connecting means comprises a pressure device connected at one end to a two-armed lever. The pressure device may be connected to the implement beam, and the lever arranged to cooperate with the implement frame, or the positioning can be reversed. By a suitable choice of the relative lengths of the arms of the two-armed lever and of other link means there may be obtained an accurate setting of the pressure required to release the connecting means.

3,605,906
SNOWPLOW WITH MEANS TO FACILITATE MOUNTING
Frank Coates, Corydon, Iowa, assignor to Coates Manufacturing Co., Corydon, Iowa
Filed Mar. 28, 1969, Ser. No. 811,305
Int. Cl. E01h *5/06;* E02f *3/76*
U.S. Cl. 172—272 6 Claims



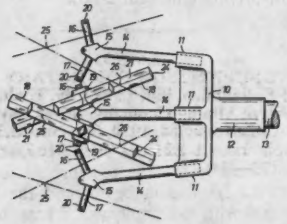
A snowplow for attachment to the forward end of a vehicle such as a truck or the like. The snowplow includes a pair of spaced apart push arms which are secured at their rearward ends to the vehicle frame and which extend forwardly therefrom. A cross beam means is secured to and extends between the forward ends of the push arms and has a hollow tube provided thereon adapted to rotatably receive a pivot shaft. The pivot shaft extends rearwardly from the blade portion of the snowplow and

is removably received by the tube to effect a pivotal or rotational connection between the cross frame means and the blade structure. A locking means is provided for detachably maintaining the pivot shaft in the tube. A lift arm assembly is connected to the cross beam means and the blade structure for raising and lowering the blade structure with respect to the cross beam means. The pivot shaft tube is mounted on a cross beam member which is rotatable about a horizontal axis and means is provided for yieldably preventing the rotational movement of the cross beam member during the periods when the blade structure is removed from the cross beam means to facilitate the subsequent attachment of the blade structure to the cross beam means.

3,605,907
HAND TOOL FOR COMMINUTING SOIL

Walter Schuring, 41 Breite Str., 4800 Bielefeld, Germany; Hans vom Braucke, 27 Karl Str., 4973 Vlotho, Germany; and Manfred vom Braucke, 259 Theesener Str., 4801 Vilsendorf, Germany

Filed July 3, 1969, Ser. No. 838,956
Int. Cl. A01b *1/04, 1/14*
U.S. Cl. 172—378 **4 Claims**

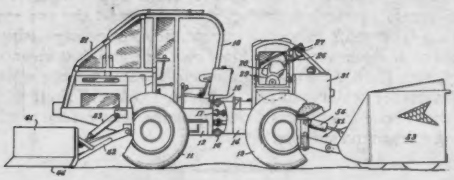


A hand tool for comminuting soil, especially for loosening, cutting and crumbling soil for agricultural or horticultural purposes comprising comminuting tools rotatably mounted at an angle relative to one another on bearing heads and arranged side by side with comminuting tools meshing with one another and forming intersecting regions located alternately on both sides of the bearing heads.

3,605,908
FORESTRY WORK VEHICLE

Raymond E. McDonald, L'Anse, Mich., Jerry T. Davis, Monticello, Ark., and Jack J. Benns, Chicago, Ill., assignors to Pettibone Corporation, Chicago, Ill.

Filed Mar. 28, 1968, Ser. No. 716,945
Int. Cl. A01b *49/04*
U.S. Cl. 172—438 **5 Claims**

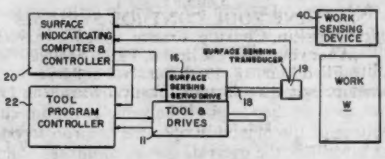


The basic work vehicle comprises a chemical sprayer carried by a rough terrain four-wheel drive chassis, articulated for steering. The sprayer is carried by the rear-half of the articulated chassis, is directed upwardly and rearwardly, and has three jet openings, each with its own mist-producing spray head, to spray a wide swath with satisfactory uniformity. The blower is driven by a hydraulic motor which makes it easily supplied with power from the forward half of the vehicle on which the engine and pumps are mounted. The hydraulic motor is of the positive displacement type and has a by-pass provided with a pressure relief valve which prevents damage when the hydraulic fluid is shut off by a manual control valve. The vehicle carries a hydraulically raiseable V shaped plow at its front end for shearing or bending aside light undergrowth and camming frame bars overhead for facilitating passage under low limbs of trees. A trailer hitch is provided and a large chemical tank is shaped to give access to the hitch under it. Attachments for the hitch include a fire lane plow and at least one planter for planting tree seeds or seedlings. Because of the articulation, the vehicle with trailer can "snake" a winding course among trees, with the front wheels, rear wheels and trailer all following the path cleared by the V shaped plow at the front.

3,605,909
TOOLING MACHINE HAVING SURFACE SENSING PROGRAM STARTING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of application Ser. No. 294,076, July 10, 1963, now Patent No. 3,481,042, which is a continuation-in-part of application Ser. No. 250,942, Jan. 11, 1963, now Patent No. 3,188,947, which in turn is a continuation-in-part of application Ser. No. 518,616, Jan. 4, 1966, now Patent No. 3,476,481. This application Nov. 13, 1968, Ser. No. 775,433
Int. Cl. B23b *39/08;* **G06f** *15/46*
U.S. Cl. 173—3 **17 Claims**



An apparatus and method are provided for operating on material by means of an automatically controlled tool and work requiring prepositioning of the tool and work surface. In one form surface-sensing means is mounted on or adjacent the tool for sensing the location of the work surface which, upon being detected thereby, either initiates an automatic cycle of operation or provides a feedback signal which is operative to correct the automatic control means or compensate for variations in the location of the surface of the work piece and the tool from one work piece to the next.

Locating the surface of the work is effected either by means of a movable probe mounted on the tool head or tool manipulator and operative to be driven into engagement with or sensing relationship with the work, or by means of locating the sensing transducer on or adjacent the tool itself which is moved to permit the transducer to sense the surface of the work prior to initiating an automatic operational cycle. In another form, the tool itself is energized to define the surface-sensing transducer and relative movement of the work and tool is effected to permit location of the work surface by the tool.

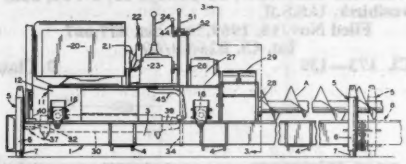
3,605,910
AUGER APPARATUS DRIVE SYSTEM

Ronald C. Deeter and William G. Young, Salem, Ohio, assignors to The Salem Tool Company, Salem, Ohio

Filed Sept. 26, 1969, Ser. No. 861,340
Int. Cl. E21c *5/10*
U.S. Cl. 173—4 **17 Claims**

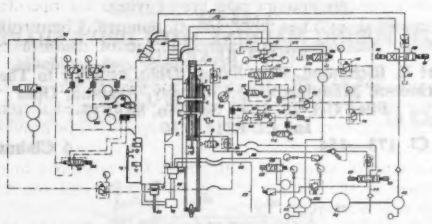
An auger machine, such as a trench drill, having an auger carriage that is moved by a cylinder that can force the auger forward into the materal being drilled by supplying the cylinder with hydraulic liquid under pressure

and at a rate corresponding to the rate of auger penetration, means being provided to insure that for the rate of penetration the pressure and power requirements will be within the capabilities of the apparatus, and that little if any liquid at high pressure is vented with loss of energy as waste heat. The hydraulic system includes a variable displacement pump for supplying liquid to the cylinder on a selected side of the piston at a controlled desired rate, means for controlling the pump to control the rate at



which fluid is supplied by the pump, and means for limiting the maximum pressure of the hydraulic liquid to an upper limit correlated to the rate of penetration of the auger, to insure that maximum pressures are within the capabilities of the apparatus, and maximum pump power requirements are within the capabilities of the power supply means such as a power takeoff from an internal combustion engine driving the auger.

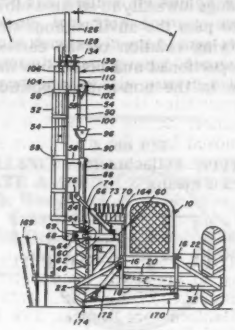
3,605,911
MACHINE TOOL CONTROL SYSTEMS
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Andre Citroen, Paris, France
Filed Mar. 18, 1969, Ser. No. 808,257
Claims priority, application France, Mar. 26, 1968, 3,482
Int. Cl. B23b *39/10*
U.S. Cl. 173—9 **9 Claims**



The axial movement of a rotating machine tool is controlled by an operating sequence valve that delivers an output signal for controlling axial movement of the tool in accordance with a variable input signal from a torque detector associated with the tool and an adjustable threshold value to which the valve is subjected.

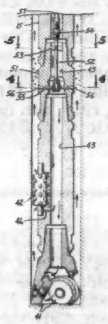
3,605,912
POST SETTING APPARATUS
Arthur L. Fisher, 112 Mar Vel Drive, Butler, Pa. 16001
Continuation-in-part of application Ser. No. 749,853, Aug. 2, 1968. This application May 5, 1970, Ser. No. 34,752
Int. Cl. E02d *7/10*; E21c *11/02*
U.S. Cl. 173—23 **8 Claims**

An attachment for a self-propelled tractor for use in setting posts is disclosed. The attachment comprises a frame structure detachably securable to the chassis of the tractor and the frame has a pair of slide rails extending crossways of the chassis when the frame structure is secured thereto. A slide is reciprocally supported on the rails for movement laterally of the chassis. A mast is supported for universal movement on the slide and a post driving unit is mounted in the mast for de-



livering a percussion blow to a fence post or the like. Also, the mast and post driving unit assembly is selectively movable forwardly or rearwardly of the tractor for alignment of the post driving unit with a post.

3,605,913
DUST SUPPRESSOR FOR ROTARY DRILLS
Gerald E. Lehtinen, Salt Lake City, Utah, assignor to Reserve Mining Company, Silver Bay, Minn.
Filed Apr. 14, 1970, Ser. No. 28,395
Int. Cl. E21b *21/04*; E21c *7/06*
U.S. Cl. 173—74 **6 Claims**

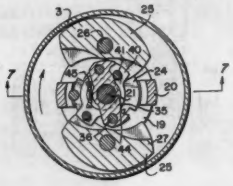


A rotary drilling rig for use in drilling blast holes for the removal of ore. The rig includes a vertically disposed rotatable shaft, the lower end of which carries a plurality of rotary cutter bits that engage and grind the ore surface. The shaft carries a compressed air passage which opens at the lower end to blow rock bits and dust upwardly from the blast hole, and a separate water passage which distributes water radially outward from the shaft at a point above the cutters to suppress the dust before reaching the ground surface.

3,605,914
ROTARY IMPACT WRENCH MECHANISM
Leo Kramer, Skillman, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Aug. 23, 1968, Ser. No. 754,824
Int. Cl. B25d *15/00*
U.S. Cl. 173—93 **31 Claims**

A rotary impact wrench clutch mechanism including a rotary anvil adapted to deliver a rotary blow to a fastener, a rotary hammer carrier mounted

around the anvil and connected to a motor, and a pair of diametrically opposed hammer dogs pivoted on the carrier to tilt inwardly to strike a blow to the anvil. The clutch mechanism includes a cam operative to tilt the hammer dogs inwardly to strike a blow and then to allow the dogs to pass the anvil without striking a blow during the following rotation of the carrier. The hammer dogs are proportioned and pivoted so that they automatically remain in the non-impact position until they



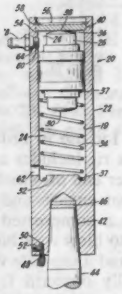
are cammed inwardly and they are returned to the non-impact position during their rebound by inertial forces following impact with the anvil. The tool clutch is operative in either direction of rotation and includes stop means for automatically preventing the dogs from tilting in the wrong direction in either direction of rotation. During the instant of impact inertial forces hold the hammer dogs against sliding out of engagement with the anvil.

3,605,915

PNEUMATIC RAPPER FOR ELECTROSTATIC PRECIPITATORS

Thomas J. Gately, Ellicott City, Bartholomew F. Quintilian, Baltimore, and Charles H. Rodgers, Sykesville, Md. (all % Koppers Company, Inc., 440 College Park Drive, Monroeville, Pa. 15146)

Filed Apr. 11, 1969, Ser. No. 815,418
Int. Cl. B03c *3/76*; B25d *9/00*
U.S. Cl. 173—116 **13 Claims**



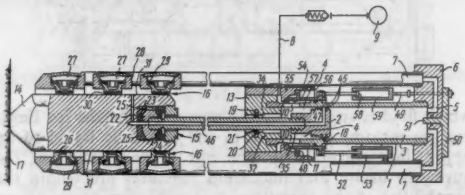
A pneumatic single-impulse rapper for electrostatic precipitators comprising a piston made from dry-lubricating material within a unitary, flangeless, cylindrical housing having no bolted connections, with the piston being returned to its pre-pulse position by a spring having reduced diameter end coils, said piston including a spherical or alternate striking surface for localized impact against the end of the housing, said housing including a non-removable cap and an air inlet adapted to secure a strengthened air fitting to the housing. A braided wire provides electrical grounding of the rapper.

3,605,916

HYDRAULIC HAMMER

Bogdan Vyacheslavovich Voitsekhovsky and Faina Fedorovna Voitsekhovskaya, Ulitsa Akademicheskaya 2; Timofei Fedorovich Gorbachev, Ulitsa Zolotodolinskaya 71; Grigory Yankelevich Shoikhet, Ulitsa Pravdy 1, kv. 37; and Vladimir Alexandrovich Girinsky, Ulitsa Zolotodolinskaya 19, kv. 2, all of Novosibirsk, U.S.S.R.; Vladimir Fedorovich Krylov, Ulitsa Ordzhonikidze 7, kv. 17, Kemerovo, U.S.S.R.; and Alexandr Ivanovich Buteev, Ulitsa Akademicheskaya 10, kv. 8; and Dmitry Timofeevich Gorbachev, Sovetskaya 13, kv. 31, both of Novosibirsk, U.S.S.R.

Filed Nov. 18, 1969, Ser. No. 877,667
Int. Cl. B25d *9/00*
U.S. Cl. 173—139 **9 Claims**



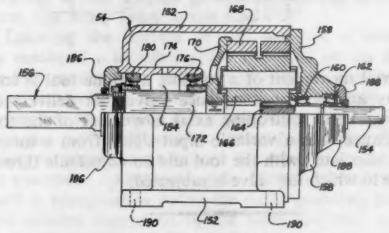
A hydraulic hammer for rock breaking has a cylinder accommodating a piston which is connected to the working member and performs the working stroke under the action of compressed gas, and the reverse stroke under the action of pressurized fluid, means being provided in the hammer permitting the piston to deflect together with the working member, from the cylinder axis under the effect of lateral forces arising as a result of the impact, produced by the working member against an uneven rock surface. Damping arrangements are provided to damp the residual energy of the working member during the impact.

3,605,917

EARTH BORING MACHINE WITH DRIVE SHAFT SUPPORT BEARINGS

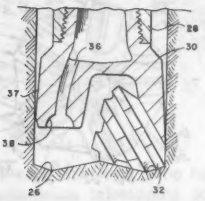
Albert R. Richmond, West Salem, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Filed Oct. 20, 1969, Ser. No. 867,817
Int. Cl. E21c *1/10*
U.S. Cl. 173—154 **6 Claims**



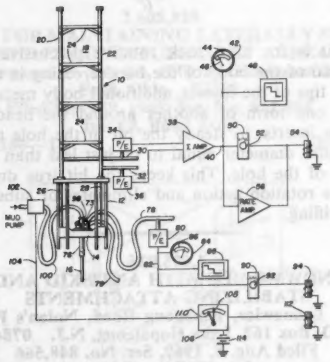
A machine for the horizontal boring of shafts for the insertion of pipelines where excavation from the surface is undesirable, such as under freeways or the like, which comprises a boring mechanism for forming the holes as well as the push function for advancing the pipeline casings. This arrangement includes a novel power train arrangement for most effectively delivering the energy from the power means to the boring and pushing apparatus, said power train being characterized by a novel drive shaft and bearing arrangement that efficiently resists bending stresses in the transmission of torsional loads from said power means to said boring and pushing apparatus.

3,605,918
DRILL BIT AND METHOD FOR EXPLOSIVE DRILLING
John D. Bennett, Denton, Tex., assignor to Sun Oil Company, Philadelphia, Pa.
Filed Dec. 15, 1969, Ser. No. 884,955
Int. Cl. E21b 7/00, 7/18, 9/35
U.S. Cl. 175—2 9 Claims



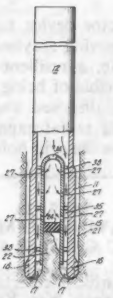
The particular embodiment described herein as illustrative of one form of the invention utilizes a drill bit having a fluid exit for passing drilling fluids from the interior of the drill pipe to the exterior of the drill bit. The surface surrounding the exit is formed in the shape of a parabola. Explosive capsules are placed in the drilling fluid stream and then moved with the drilling fluid through the drill stem and out the opening in the bit for impact with the formation, whereupon the explosive capsule is detonated. Primary energy in the form of a shaped jet charge is directed into the formation to penetrate the bottom of the borehole and cause fracturing of formation materials. In addition, upwardly directed energy from the shaped explosive charge is reflected from the parabolic-like surface of the drill bit to provide a secondary energy source directed against the formation at the bottom of the borehole.

3,605,919
DRILLING RIG CONTROL
Raymond J. Bromell, Dallas, Tex., and George Homanick, Livonia, Mich., assignors to Automatic Drilling Machines, Inc., Dallas, Tex.
Filed May 16, 1969, Ser. No. 825,322
Int. Cl. E21b 3/02, 7/00, 19/08
U.S. Cl. 175—27 10 Claims



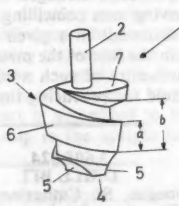
The operation of a drilling rig is monitored and controlled to prevent damage or unnecessary delay due to the occurrence of off-normal operation. For example, drill string twistoff may be indicated by a sudden decrease in the total weight of the drill string, a sudden decrease in drilling torque, or a sudden decrease in mud pump pressure. Each of these three variables in monitored, and a departure of any one of the three from an established level may be used to sound an alarm. A sudden decrease in the drill string weight actuates a control relay which may shut down the drilling rig operation completely, or any part thereof. A sudden decrease in drilling torque and/or a sudden decrease in mud pump pressure similarly operates a control relay to shut down the drilling rig operation completely, or any part thereof.

3,605,920
CORE DRILLING APPARATUS WITH MEANS TO INDICATE AMOUNT OF CORE IN BARREL
Charles D. Woodward, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed Dec. 30, 1969, Ser. No. 889,046
Int. Cl. E21b 25/00, 45/00
U.S. Cl. 175—46 1 Claim



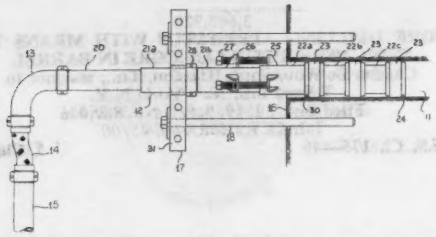
The core barrel of a core drill has longitudinally spaced ports in its sidewalls and a plug slidable in the barrel. As the core enters the barrel it raises the plug, blocking the ports in turn and thus producing pressure changes or anomalies in the drilling fluid indicative of the amount of core in the barrel.

3,605,921
DRILL FOR PRODUCING HOLES FOR PLANTS IN FLOWER POTS OR OTHER CONTAINERS
Georg Mayer, Bolheim, Germany, assignor to Firma Mayer KG, Heidenheim-Mergelstetten, Germany
Filed Sept. 11, 1969, Ser. No. 857,169
Claims priority, application Germany, Sept. 11, 1968, P 17 82 509.1
Int. Cl. E21c 13/04; A01c 11/00
U.S. Cl. 175—108 6 Claims



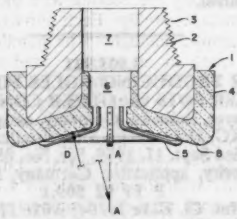
A drill for producing holes for plants in flower pots or other containers having a shank and a drill body wherein the drill body has at least one rising, worm-shaped spiral flute and the body portion between the spiral flute extends from the tapered lower end of the drill body up to its upper end.

3,605,922
DRILL HOLE CONNECTOR DEVICE
Willard I. Bergeron, 478 Surprenant, Drummondville, Quebec, Canada, and John David Gallagher, Chapais, Abitibi East, Quebec, Canada
Filed July 29, 1969, Ser. No. 845,718
Claims priority, application Canada, June 21, 1969, 54,995
Int. Cl. E21b 23/06, 33/02
U.S. Cl. 175—210 7 Claims



A drill hole connector device for use in mines which comprises a housing having a cylindrical portion adapted to fit into a drill hole, a resilient ring surrounding the housing and being capable of being compressed by means of an external sleeve disposed about the housing. The axial compression and radial expansion of the resilient ring holds the device in the drill hole.

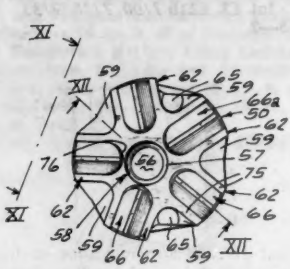
3,605,923
DIAMOND BITS HAVING DIAMONDS POSITIONED IN CONCENTRIC CIRCLES ON THE DRILLING FACE
Robijn Feenstra, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Original application Mar. 6, 1967, Ser. No. 620,839. Divided and this application Jan. 24, 1969, Ser. No. 813,352
Int. Cl. E21b 9/36
U.S. Cl. 175—329 7 Claims



A drilling bit having diamonds embedded in the drilling face, with the diamonds arranged in a pattern of concentric circles having axes coinciding with the axis of the bit. All of the diamonds in a given circle will subscribe a common path in the face of the material being drilled. A method of manufacture of such a bit is disclosed, along with a special mold for practicing the method.

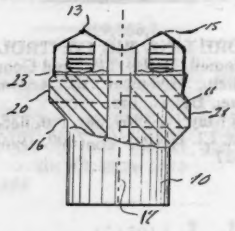
3,605,924
DRILL BIT
Edward A. Donegan, St. Catharines, Ontario, Canada, assignor to Thompson Products, Ltd., St. Catharines, Ontario, Canada
Filed Aug. 26, 1969, Ser. No. 853,051
Int. Cl. E21c 13/01, 13/06
U.S. Cl. 175—400 12 Claims

A single pass percussion drill bit having from five to nine wings around a central hole, each carrying a shallow, wide, hard insert tooth in a flat narrow end face thereof and having free flow chip discharge passages between the teeth. The bit body has a flat front face with a separate slot for each insert, and each insert has its inner end butted against a shoulder at the inner end of the slot. The inserts



are wide and shallow to provide maximum cutting faces with minimum material, may be of the same or different lengths, and will be spaced in accordance with the placement of a central flushing hole and chip clearance grooves in the bit body.

3,605,925
NON RIFLING DRILL BIT
Irvine Berscheid, Flin Flon, Manitoba, Canada, assignor to I. J. Berscheid and Associates Limited, Queenston Bay, Winnipeg, Manitoba, Canada
Continuation-in-part of abandoned application Ser. No. 706,921, Feb. 20, 1968. This application Sept. 2, 1969, Ser. No. 854,667
Int. Cl. E21c 9/00, 13/00
U.S. Cl. 175—408 2 Claims

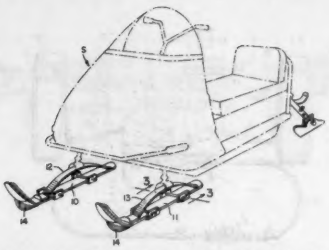


The bit is for hard rock rotative percussive drilling and instead of the body of the bit decreasing in diameter from the tips of the inserts, additional body metal is provided in one form or another around the head spaced below the inserts, to steady the bit in the hole and having an outer diameter equal to or just less than the true diameter of the hole. This keeps the bit true during the percussive rotation action and eliminates or substantially reduces rifling.

3,605,926
SNOWMOBILE WITH ANTISKID AND STABILIZING ATTACHMENTS
Felix Leonawicz, Espanong Road, Nolan's Point, P.O. Box 162, Lake Hopatcong, N.J. 07849
Filed Aug. 8, 1969, Ser. No. 848,566
Int. Cl. B62m 27/02
U.S. Cl. 180—5R 10 Claims

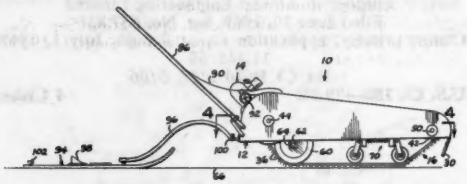
This specification discloses a snowmobile with attachments which adapt it for use on ice and hard-packed snow. One of these attachments comprises runners of V-shaped cross-section that are applied to the front steering runners of the vehicle. The other is a stabilizer mounted on the rear of the snowmobile. The stabilizer

consists essentially of a pair of arms, each pivotally connected to the rear end of the vehicle and extending downwardly and outwardly with their lower ends assuming a position outboard of the snowmobile. Pivotally mounted



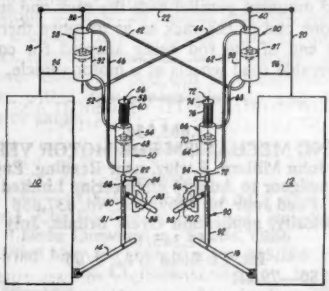
on the free end of each arm is a shoe having a chisel edge. Each arm comprises telescoping sections which render it adjustable in length and a tension spring has its ends connected to the arms to generate inward pressure thereon.

3,605,927
POWERED ENDLESS TRACK VEHICLE
David L. Wells, 1813 Cottonwoods Road, Carrollton, Tex. 75006
Filed Sept. 17, 1969, Ser. No. 858,775
Int. Cl. B62m *27/02*
U.S. Cl. 180—5R **2 Claims**



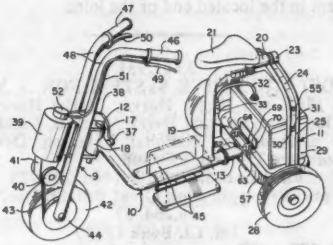
A frame transversely journals sprockets and wheels around which an endless track is entrained and engaged by the sprockets for movement of the track. One of the sprockets is driven by a motor mounted on the frame. Means, connected with the frame in trailer-like fashion, transports the user. Handle control means, connected with the frame, projects rearwardly thereof toward the operator.

3,605,928
SYSTEM FOR MAINTAINING LATERALLY SPACED VEHICLES LONGITUDINALLY ABREAST
Raymond W. Loesch, 1601 E. Oklahoma St., Enid, Okla. 73701
Filed Sept. 29, 1969, Ser. No. 861,868
Int. Cl. B60d *7/00*
U.S. Cl. 180—14 **20 Claims**



A system for simultaneously operating a plurality of vehicles from one of the vehicles to automatically maintain them in horizontal alignment abreast of each other, which system includes a linkage interconnecting the steering mechanisms of the vehicles to produce identical turning movement in the vehicles, and a closed hydraulic-mechanical system which is connected to speed control devices on the several vehicles so that any vehicle which advances beyond other vehicles in the array will actuate a hydraulic signal which is used to change the relative speeds of the vehicles to restore horizontal alignment of the several vehicles.

3,605,929
ONE RIDER GOLF CART
Burton A. Rolland, 332 Dawson Ave., Rockford, Ill. 61107
Filed July 7, 1969, Ser. No. 839,298
Int. Cl. B62d *61/08*
U.S. Cl. 180—26 **15 Claims**

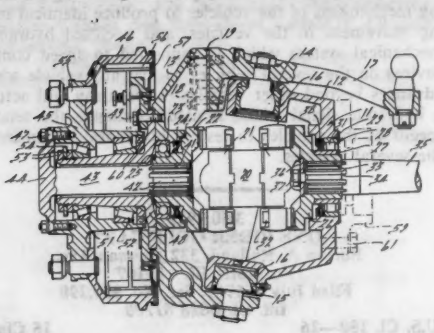


The three-wheel cart comprises three sub-assemblies designed to be easily assembled and disassembled, namely, a front steering fork assembly detachably connected by a withdrawable king-pin with the front end of the front frame assembly, on which the driver's seat is carried, and a rear frame assembly pivotally and detachably connected to the rear end of the front frame assembly by means of an axle working in a fore and aft rear lower bearing, spacer sleeve and pilot bearing, two withdrawable pins detachably connecting the bearing with the lower portion of the rear frame assembly. Each sub-assembly is light enough and compact enough to be handled readily and stored in the trunk of an average sized automobile for transportation. The drive means is carried on the front fork and transmits drive to the front steerable wheel, and brake means is also provided working on the same wheel. A rigid upright frame of inverted U-shape on the rear frame assembly has an arcuate track on its upper end struck on an arc with the rear axle as a center and has a roller on the back of the seat support running thereon between widely spaced stops, allowing a wide range of tilting of the front fork and front frame relative to the rear frame for operation like a bicycle or motorcycle. The upright frame also has a battery carrier case pivotally suspended therein permitting upright positioning of the battery with the case during transportation independently of the rest of the rear frame assembly, the two withdrawable connector pins having head ends that hook onto the carrier case when the cart is assembled to hold the carrier case in rigid relationship to the upright frame.

3,605,930
STEERABLE DRIVING AXLE
Laine J. Ainsworth, Oakland, Calif., assignor to Kelsey-Hayes Company
Filed Nov. 26, 1968, Ser. No. 778,991
Int. Cl. B60k *17/30*
U.S. Cl. 180—43R **6 Claims**

The steerable driving axle is driven through a double cardan universal joint suspended inside a steerable drive

with the outer end fixed and the inner end movable within a roller bearing carried by the inner suspension member. This arrangement positions the universal joint and permits the removal of the outer driven axle and its replacement in the located end of the joint.



3,605,931

HYDROSTATIC DRIVE SYSTEM FOR A VEHICLE

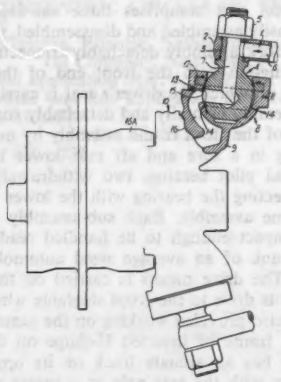
Donald Firth and Roger Harvey Yorke Hancock, East Kilbride, Glasgow, and Derek Mitchell, Larkhall, Scotland, assignors to National Research Development Corporation, London, England

Filed Dec. 6, 1968, Ser. No. 781,925

Claims priority, application Great Britain, Dec. 11, 1967, 56,254/67

Int. Cl. B60k *17/30*

U.S. Cl. 180—43R **5 Claims**



A hydrostatic drive system for a vehicle in which a hydraulic motor is mounted in the steerable vehicle wheel or immediately adjacent the vehicle wheel and movable with it. The system includes a conduit for conveying fluid from an engine driven pump to the motor via a fluid coupling. The fluid coupling is preferably in the form of a ball joint having a swivel axis substantially aligned with the steering or king pin axis of the wheel.

3,605,932

STEERING SYSTEM FOR MOTOR VEHICLES

Karl Wilfert, Gerlingen-Waldstadt, and Rudolf Andres, Sindelfingen, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

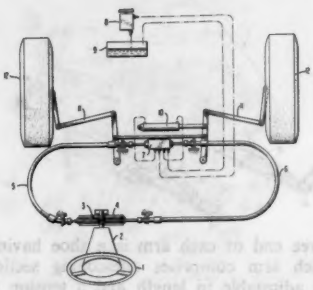
Filed Apr. 2, 1969, Ser. No. 812,728

Claims priority, application Germany, Apr. 3, 1968, P 17 55 136.9; June 8, 1968, P 17 55 685.3

Int. Cl. B62d *5/06*

U.S. Cl. 180—79.2R **19 Claims**

A steering system for motor vehicles which operates with an auxiliary force assist and in which flexible mechanical connecting elements are used for the transmission of the steering wheel movements; one such flexible connecting element is provided for each actuation direction of the steering system and is so designed that the force necessary for the steering can also be transmitted thereby in case of failure of the auxiliary force.



3,605,933

STEERING MECHANISM FOR MOTOR VEHICLES

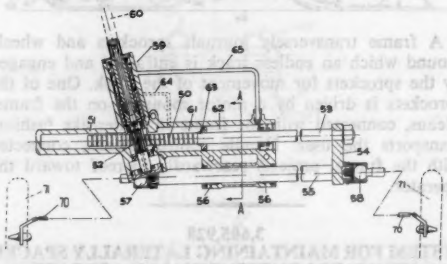
Barry John Millard, Earley, near Reading, England, assignor to Adwest Engineering Limited

Filed June 30, 1969, Ser. No. 837,856

Claims priority, application Great Britain, July 1, 1968, 31,345/68

Int. Cl. B62d *3/12, 5/06*

U.S. Cl. 180—79.2R **4 Claims**



A steering mechanism for a motor vehicle comprising a toothed rack slidable in a housing and having one end thereof projecting from the housing, a pinion in meshing engagement with the rack and rotatable to move the rack, and a rod mounted parallel with the rack and secured to the said one end of the rack so as to move therewith, at least one end of the rod being adapted for connection to the steerable road wheels of a motor vehicle.

3,605,934

STEERING MECHANISM FOR MOTOR VEHICLES

Barry John Millard, Earley, near Reading, England, assignor to Adwest Engineering Limited

Filed June 30, 1969, Ser. No. 837,858

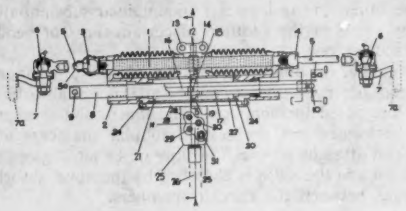
Claims priority, application Great Britain, July 1, 1968, 31,345/68

Int. Cl. B62d *3/12, 5/06*

U.S. Cl. 180—79.2R **5 Claims**

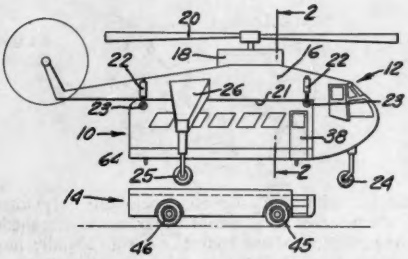
Steering mechanism for a motor vehicle, the mechanism comprising a rod member adapted to be fixedly secured to a motor vehicle, a casing slidable on the rod

member, a toothed rack carried by the casing and connectable with the steerable road wheels of a motor vehicle, and a pinion in meshing engagement with the toothed rack and connectable with the steering control of



a motor vehicle, the pinion being rotatable to effect longitudinal movement of said rack and said casing relative to the rod member.

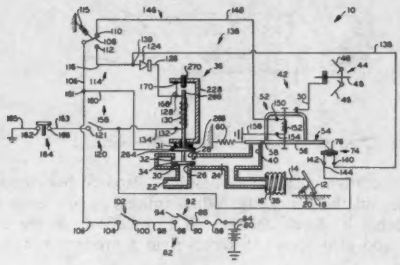
3,605,935
AIR SURFACE RAPID TRANSIT VEHICLE
Richard H. Gilbert, P.O. Box 4206, Riverside, Calif. 92504
Continuation-in-part of abandoned application Ser. No. 756,716, Aug. 8, 1968, which is a continuation-in-part of abandoned application Ser. No. 609,467, Jan. 16, 1967. This application Jan. 6, 1970, Ser. No. 913
Int. Cl. B60k *35/00;* **B64c** *37/02;* **B64d** *9/00*
U.S. Cl. 180—89 **14 Claims**



A passenger- or cargo-carrying pod is detachably connected to a helicopter for high-speed transport thereby between metropolitan and suburban depots, and is then transferred to and locked onto a self-propelled power unit of one type or another, for transport on the ground. In one case, the power unit comprises an automotive-type chassis having wheels that run on the street or highway. The chassis has a self-contained power plant and transmission for driving the wheels, as well as steering mechanism, brakes, lights, etc., which are operated by controls within the pod. In another case, the power unit comprises a chassis having wheels that run on one or more tracks, such as a monorail. When mounted on either of the power units, the pod can be transported over a fixed route within the city to pick up and discharge passengers or cargo.

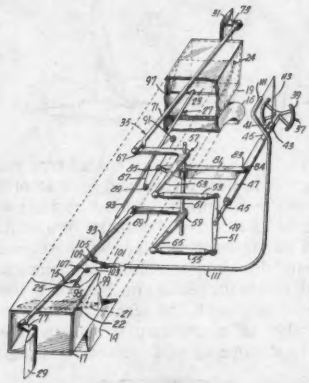
3,605,936
SPEED CONTROL WITH ADVANCE FEATURE
James A. Charles, Greens Fork, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed May 16, 1969, Ser. No. 825,285
Int. Cl. B60k *31/00*
U.S. Cl. 180—108 **20 Claims**

A speed control system is provided which utilizes manifold vacuum pressure, as modified by atmospheric pressure, to control an engine throttle and thereby maintain an automotive vehicle at a desired speed. The speed control system includes an electro-magnetic means and a control circuit interrupting means for providing the speed



control system with advanced speed actuation. Once a new speed has been obtained the speed control system may again be placed in speed controlling mode.

3,605,937
MOVEMENT CONTROL SYSTEM FOR FLUID PRESSURE VEHICLES
Charles Peter Kirwan, Brossard, Quebec, Canada, assignor to Canive Industries Ltd., Brossard, Quebec, Canada
Filed Feb. 19, 1969, Ser. No. 800,454
Int. Cl. B60v *1/14*
U.S. Cl. 180—120 **6 Claims**

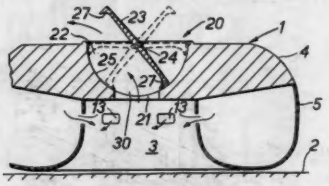


A control system for air-cushion vehicles requiring only a single control member to control, using a portion of the air pressure supplied to support the vehicle, the movement of the vehicle in one or more directions.

3,605,938
FLUID-FLOW CONTROL APPARATUS
Paul Dominic Davis, 4 Firtree Grove, Butts Ash Lane, Hythe, Southampton, England, and John Norman Lane, "Sukiyaki," 16 Linden Gardens, Hedge End, Southampton, England
Filed Apr. 1, 1969, Ser. No. 812,094
Claims priority, application Great Britain, Apr. 5, 1968, 16,407/68
Int. Cl. B60v *1/14*
U.S. Cl. 180—120 **5 Claims**

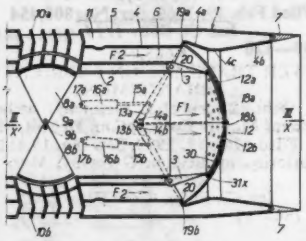
A flow control valve, suitable for venting cushion air from an air-cushion vehicle so as to apply lateral or

longitudinal thrust forces thereto, comprises a butterfly-valve member mounted for rotation within a concavity. The hollow of the concavity is connected to the cushion space of the vehicle. The butterfly-valve member has



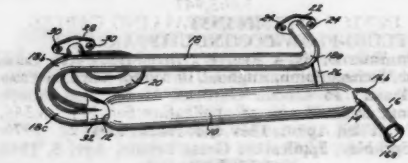
three operative positions. When it is disposed horiozntally it closes off the concavity. When rotated in one direction or another it allows cushion air to escape from the concavity and also serves to direct it in a predetermined direction.

3,605,939
DEVICE FOR REDUCING THE NOISE PRODUCED BY FLUID FLOW ESCAPING FROM A NOZZLE
Louis Duthion, Paris, France, assignor to Bertin & Cie, Boite Postale, France
Filed Dec. 30, 1969, Ser. No. 889,165
Claims priority, application France, Dec. 30, 1968, 182,228
Int. Cl. B64d *33/06*
U.S. Cl. 181—33HC **18 Claims**



A noise reducing device for an ejector type nozzle having a primary fluid flow surrounded by a secondary fluid flow, which device comprises a hollow obstacle which can be arranged to intercept the primary flow and includes a number of passages for splitting the intercepted portion of the primary flow into a number of elementary flows, together with means for placing the interior of the obstacle into communication with the secondary flow thereby to form a number of elementary secondary flows which envelop at least some of said elementary primary flows.

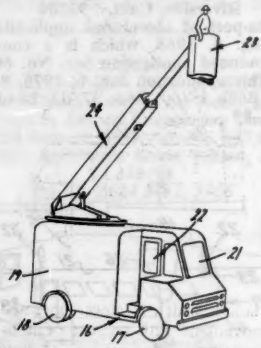
3,605,940
EXHAUST HEADER SYSTEM
Wayne A. Christensen, 1959 Harbor Blvd., Costa Mesa, Calif. 92627
Filed May 12, 1969, Ser. No. 823,927
Int. Cl. F01n *1/04*; F02b *27/00*
U.S. Cl. 181—42 **5 Claims**



The exhaust header system is for use with an internal combustion engine, as for instance with the Porsche 911, wherein the cylinders are divided into two exhaust banks. The system comprises a muffler which is connected to exhaust conduits from the respective cylinder banks, which conduits are adapted to provide substantially the same resistance to the flow of exhaust gases therethrough. Notwithstanding the fact that one such conduit is longer than the other, the resistance is maintained substantially equal by virtue of the addition of certain turns or bends in the shorter one.

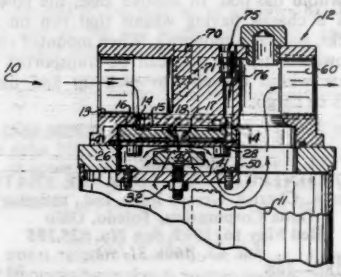
The muffler is unique in having coaxially arranged inner and outer tubular members and noise absorbing means interposed therebetween. The inner tubular member is perforated but the several tubular members are maintained straight so that the flow of exhaust gases is unimpeded and the noise is absorbed by the noise absorbing means between the tubular members.

3,605,941
AERIAL LIFT WITH ROTATABLE AND ENCLOSABLE BASKET
Chester P. Edwards, Redwood City, Calif., assignor to General Cable Corporation, San Carlos, Calif.
Filed Jan. 9, 1969, Ser. No. 790,006
Int. Cl. B66f *11/04*
U.S. Cl. 182—2 **21 Claims**



Aerial lift with rotatable and enclosable workman's basket which serves as an aerial workshop having means permitting rotation of the basket in a substantially horizontal plane through substantially more than 90° and having means for enclosing the basket to protect the workman against inclement weather and providing light and heat and ventilation.

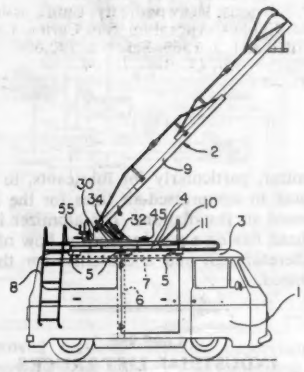
3,605,942
MIST GENERATOR
William W. Lyth, Cleveland, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed May 19, 1969, Ser. No. 825,726
Int. Cl. F16n *7/32*
U.S. Cl. 184—6.26 **22 Claims**



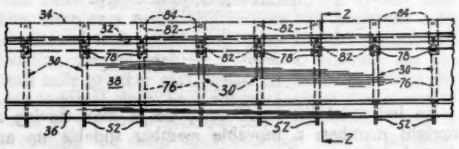
A mist generator comprises means defining a vortex chamber having an inlet and an outlet. The vortex

chamber creates a rotating flow of fluid which moves in a direction generally axially of the direction of rotation thereof. The rotating flow of fluid moves past an oil gap and draws oil from the oil gap thereinto. As the fluid flows beyond the oil gap, it encounters a mist density adjustment means which is located in the path of the rotating fluid. The mist density adjustment means comprises a particle size regulator disc or member which is adjustable toward and away from the vortex outlet to control the suction which is created by the rotating fluid flow in the oil gap.

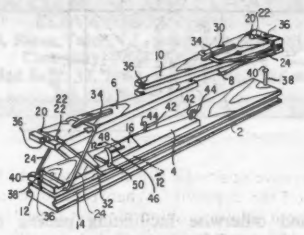
3,605,943
AERIAL LADDER
Marcel Beaudet, 11 Boulanger Blvd., and Cyrille Blais, Blais Road, both of Warwick, Quebec, Canada
Filed Oct. 20, 1969, Ser. No. 867,820
Int. Cl. E06c *5/08*
U.S. Cl. 182—67 **9 Claims**



An aerial ladder which is power operated for swinging and tilting movement with respect of a base mounting, said base mounting so designed as to have a minimum height and thus a very low center of gravity, such that the base mounting and ladder are especially adapted to be mounted on the roof of a small truck, whereby a person standing at the end of the extended ladder, with the ladder oriented transversely of the truck will not be able to overturn the truck even if the latter has no ground engaging stabilizers.

3,605,944
ADJUSTABLE SCAFFOLD AND BRACKET
Wendell Cleghorn, 1231 Old Atlanta Road, Griffin, Ga. 30223, and Richard Rogers, 150 Lake Drive, Fayetteville, Ga. 30214
Filed Dec. 12, 1969, Ser. No. 884,600
Int. Cl. E04g *3/08*
U.S. Cl. 182—82 **9 Claims**

A scaffold having an adjustable tubular frame supporting a scaffold board and having adjustment fasteners connected to the tubing for adjusting and mounting a form support.

3,605,945
SCAFFOLD HORSE
Eugene W. Knuth, Land O'Lakes, Wis. 54540
Filed July 28, 1970, Ser. No. 58,760
Int. Cl. E04g *1/32;* **F16m** *11/00*
U.S. Cl. 182—151 **8 Claims**

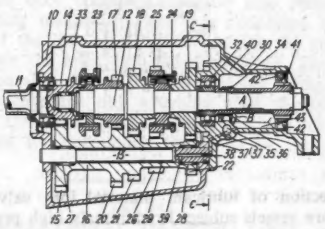


A wooden scaffold horse made in several readily assembled and disassembled parts each being constructed to cooperate when in both knocked down and step-up position of parts whereby to form a more secure and symmetrical package for both handling and shipment and a more rigid load supporting horse with the minimum of time and labor.

ERRATUM

For Class 184—6.26 see:
Patent No. 3,605,942

3,605,946
POWER TRANSMISSION LUBRICATION ARRANGEMENT
Adolf Oehl, Budenheim, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 11, 1970, Ser. No. 18,411
Claims priority, application Germany, Mar. 20, 1969, G 69 11 180
Int. Cl. F01m *9/06;* **F16n** *7/40*
U.S. Cl. 184—11 **7 Claims**

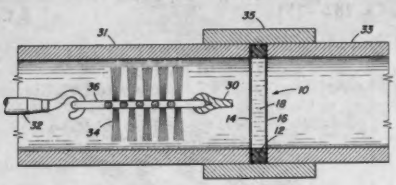


In a vehicle power transmission lubricant is pumped by a pair of meshing helical gears to lubricate highly loaded bearings of the transmission when the transmission is operative to provide forward drive for the vehicle.

3,605,947
DEVICE USED IN INSTALLING CABLES IN CONDUITS
Phillip Salerno, 7208 Ave. W., Brooklyn, N.Y. 11234, and Michael Sammaritano, 910 Manor Lane, Bayshore, N.Y. 11706
Continuation-in-part of application Ser. No. 23,346, Mar. 27, 1970. This application July 22, 1970, Ser. No. 57,268
Int. Cl. F16n *1/00*
U.S. Cl. 184—15R **11 Claims**

A conduit in which an electrical cable or the like is to be installed has rupturable containers of lubricant in-

stalled therein. The containers are broken during installation of the electrical cable thereby releasing the lubricant in the conduit and reducing the friction of the electrical



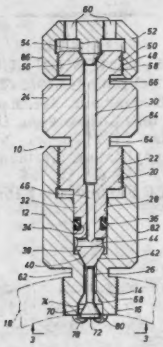
cable and otherwise facilitating pulling of the cable through the conduit.

3,605,948

LUBRICANT FITTING FOR VALVES

Robert O. Wynn, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 20, 1970, Ser. No. 7,282
Int. Cl. F01m *1/18*; F16n *21/06*
U.S. Cl. 184—6.4 **8 Claims**



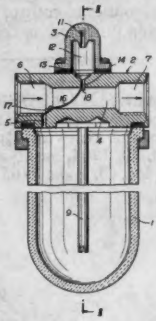
Injection of lubricant material into valves or other pressure vessels subject to extremely high pressure, is accomplished by a lubricant fitting including a plurality of sequentially operable valves of various constructions in order to achieve proper connection of the lubricant fitting to a lubricant supply system without risking erosion of the valve seats within the lubricant fitting by the high pressure fluid within the valve or pressure vessel. The lubricant fitting also includes a frangible portion that will enable the fitting to become severed at a preselected portion thereof, in the event the lubricant fitting is subjected to extremely high impact forces. The fitting also includes a safety valve structure that is disposed at the inner most portion of the lubricant fitting inwardly of the frangible portion thereof, in order that a fluidtight seal may be developed to prevent valve leakage in the event the lubricant fitting should inadvertently become severed. In order to assist in preventing erosion of the valve seats within the lubricant fitting, the velocity of fluid flow through the lubricant fitting is maintained at a low level by an internal restricted portion of the lubricant passage formed therein.

3,605,949

ATOMIZER, PARTICULARLY FOR LUBRICANTS

Erwin Vock, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Mar. 14, 1967, Ser. No. 623,003
Claims priority, application Austria, Mar. 18, 1966, 2,587
Int. Cl. F16n *7/34*
U.S. Cl. 184—55A **1 Claim**



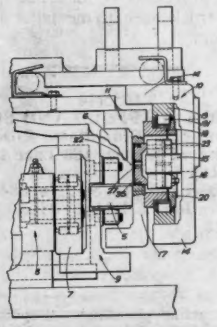
An atomizer, particularly for lubricants, to produce a fine oil spray in compressed-air lines for the lubrication of compressed air installations. The atomizer includes an atomizer head having a passage for the flow of a gaseous medium therethrough and a container for the material to be atomized.

3,605,950

INDUSTRIAL LIFT TRUCKS

Ronald Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, Hampshire, England

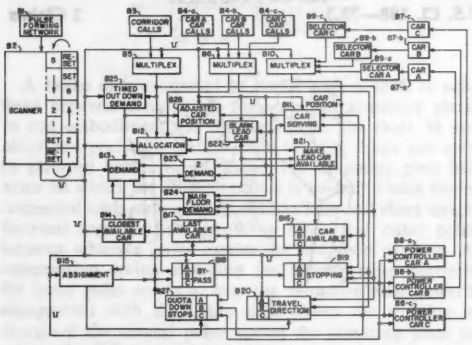
Filed Aug. 28, 1969, Ser. No. 853,739
Claims priority, application Great Britain, Aug. 30, 1968, 41,602/68
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 **9 Claims**



An industrial lift truck comprises a mast having an upright member; a movable member slidable up and down in relation to the upright member, the upright member having a channel section with a web part and flanges facing the movable member; a roller assembly mounted on the movable member between the flanges of the channel section and comprising an outer roller engaging the flanges of the channel section, a housing around which

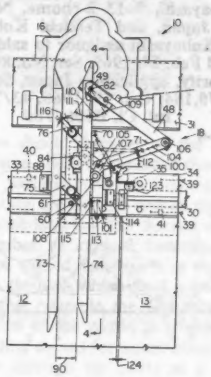
the outer roller is rotatably mounted, removable bolts securing the housing to the movable member, an inner roller mounted within the housing and partially projecting therefrom to engage the web part of the channel section, and a mounting for the inner roller which is adjustable within the housing towards and away from said web part. The mounting for the inner roller slides along the bolts which thereby prevent rotation of the mounting, and the roller assembly as a whole is slidable along the channel section upon removal of the bolts.

3,605,951
PULSE-SUPERVISED MULTI-VEHICLE TRANSPORTATION SYSTEM
Andrew F. Kirsch, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 17, 1968, Ser. No. 784,308
Int. Cl. B66b *1/22*
U.S. Cl. 187—29 **57 Claims**



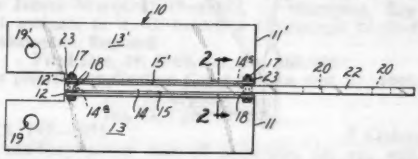
An improved multi-car elevator supervisory system wherein movement of the cars is controlled by pulse driven logic circuits. In addition to the predetermined number of car and first direction corridor calls allocated to cars traveling in the first direction to serve first direction calls, a predetermined number of first direction corridor calls are allocated to cars while traveling in the second direction on assignment to serve first direction calls. Exess corridor calls not allocated to cars serving in the direction of the calls or traveling in the opposite direction to serve in the direction of the calls create a demand for an extra car. Cars traveling in the second direction to serve first direction corridor calls are not assigned to any specific first direction corridor call. They all travel for the farthest first direction demand until one car has passed all the first direction demands except the farthest one at which time it is committed to the farthest demand while the other cars are permitted to see the next farthest demand. If the distance between corridor calls is excessive, a demand for an extra car is created even though less than the predetermined number of calls have been allocated to the assigned cars. Corridor calls registered for more than a predetermined time are given preferred treatment. Since cars on assignment to serve preferred calls bypass nonpreferred calls, the system considers these cars to be approaching the preferred calls regardless of their actual position so that the normal call allocating circuits may be utilized to allocate the bypassed calls to other cars. When no car is located at the lower terminal floor an artificial demand for a car to be sent to the lower terminal is created unless a car is approaching the main floor with less than a predetermined number of calls allocated to it. In the absence of such a car, a car is assigned to serve the artificial demand at the lower terminal; however, it will reverse and serve the lowest actual up corridor call between it and the lower terminal floor should a call be registered. A down traveling car will bypass all remaining down corridor calls after making a predetermined number of stops with passengers on board. Such a car will not be considered in the allocation of calls to cars serving down corridor calls.

3,605,952
DOOR COUPLING APPARATUS FOR ELEVATOR SYSTEMS
John Lusti, River Vale, N.J., assignor to Otis Elevator Company, New York, N.Y.
Filed Sept. 30, 1969, Ser. No. 862,186
Int. Cl. B66b *13/12*
U.S. Cl. 187—51 **16 Claims**



A door coupling apparatus for an elevator system for coupling and driving an elevator car door and a hoistway door of an elevator system for simultaneous movement of the doors between open and closed positions. The door coupling apparatus includes a vane assembly, which is mounted on the car door copuling the hoistway door thereto, and includes an elongate link assembly which has one end thereof connected to the vane assembly for urging the vane assembly to couple the doors and for latching the vane assembly after the doors are coupled together. The door coupling apparatus also includes a door operating mechanism which is connected to the other end of the link assembly for driving the coupled doors between the open and closed positions. The door coupling apparatus also includes a releasing member arranged to engage the link assembly after the coupled doors reach the closed position for unlatching the vane assembly and for uncoupling the doors in the closed position.

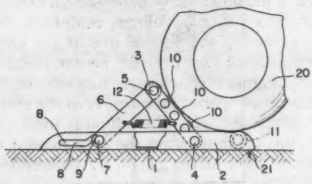
3,605,953
BIDIRECTIONAL DAMPING UNIT
Donald B. Caldwell, East Oakdale Township, Washington County, Carl A. Dahlquist, Roseville, and Robert L. Elton, White Bear Lake, Minn., and Leslie E. Robertson, Fairfield County, Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of application Ser. No. 746,053, July 19, 1968. This application May 26, 1969, Ser. No. 830,577
Int. Cl. F16f *7/08*
U.S. Cl. 188—1 **11 Claims**



A damping unit for use in a building structure subject to subsonic oscillations such as the wind may induce

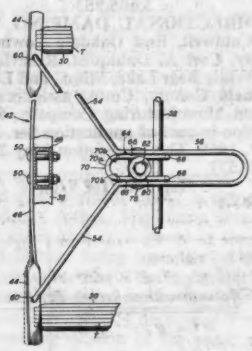
in a tall building or stack or bridge. The damping unit includes at least a pair of rigid members having broad surfaces separated by a viscoelastic layer. The improvement resides in the viscoelastic material which may be a copolymer of acrylic monomers such as a copolymer of isooctyl acrylate and acrylic acid. The viscoelastic layer may be adherently bonded to the broad rigid surfaces by a room-temperature-curing epoxy resin composition.

3,605,954
EMERGENCY STOPPING DEVICE FOR AUTOMOBILES
Manzo Wakabayashi, 7–13 2-chome, Nishirokugo, Otaku, Tokyo, Japan, and Teikichi Kobayashi, Shibata, Japan; said Kobayashi assignor to said Wakabayashi
Filed Feb. 24, 1969, Ser. No. 801,270
Claims priority, application Japan, Sept. 30, 1968, 43/70,184; Oct. 19, 1968, 43/75,847
Int. Cl. B60t *1/00*
U.S. Cl. 188—4 **5 Claims**



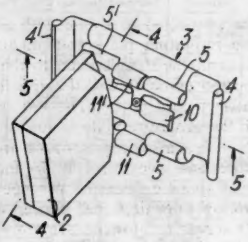
The present invention relates to a device for stopping an automobile in case of an emergency, said device being characterized by the fact that it comprises a channel-shaped base plate supporting one end of a frame. Rollers are pivotally attached to the frame, said rollers, together with another roller at one end of the channel-shaped base plate, serving as idler rollers for the automobile wheels. Anti-skid projections are provided on the bottom of the channel-shaped base plate, and a strut which holds the frame upright to prevent the forward movement of the wheel is held in place by suitable spring means.

3,605,955
BRAKING ASSEMBLY FOR STROLLERS AND THE LIKE
William G. Ballenger, Highland Park, Ill., assignor to Central Specialties Co., Chicago, Ill.
Filed Jan. 5, 1970, Ser. No. 693
Int. Cl. B62b *9/08*
U.S. Cl. 188—20 **8 Claims**



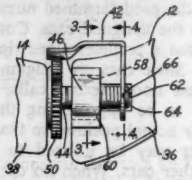
A braking assembly in which a wheel contacting member is engaged and disengaged by movement of a locking member in contact with a transverse stationary member. The member is flexible and has a yoke member attached at the ends thereof, the center portion of the yoke forming a loop extension to which manual braking force is applied. The locking member is adjustably attached to the loop extension.

3,605,956
COMBINED COVER AND BRAKE PAD RETAINER FOR DISK BRAKES
Heinz Gunter Hahm and Helmut Marschall, Frankfurt am Main, and Mustafa Demirsoy, Darmstadt, Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 28, 1969, Ser. No. 853,681
Claims priority, application Germany, Aug. 29, 1968, P 17 75 586.1
Int. Cl. F16d *55/22*
U.S. Cl. 188—72.3 **2 Claims**



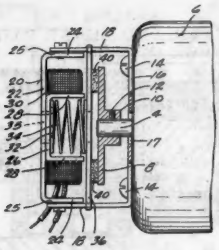
A combined cover and brake pad retainer for disk brakes having an access opening adjacent to the disk for the replacement of the brake pads including a snap-on sheet metal cover plate with sides which are bent radially inward to form guide rails for the brake pads. A cross spring for urging the brake pads away from the disk is attached to the underside of the cover plate.

3,605,957
ADJUSTER MECHANISM
Joseph L. Mossey, South Bend, Ind., assignor to The Bendix Corporation
Filed Mar. 24, 1969, Ser. No. 809,859
Int. Cl. F16d *65/46*
U.S. Cl. 188—79.5 **3 Claims**



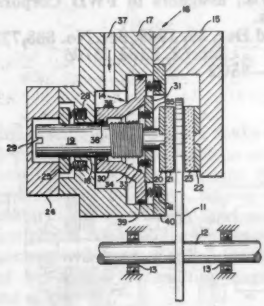
A brake equipped with an adjuster mechanism interposed between adjacent ends of a pair of brake shoes to compensate for shoe wear, comprising an extendible strut interconnecting the unanchored ends of said brake shoes and a locking means for controlling the extension of said strut.

3,605,958
SPRING-APPLIED, ELECTRICALLY-RELEASED BRAKE
Richard H. McCarthy, Milwaukee, Wis., assignor to Stearns Electric Corporation, Milwaukee, Wis.
Filed Jan. 21, 1970, Ser. No. 4,640
Int. Cl. F16d *65/24*
U.S. Cl. 188—171 10 Claims



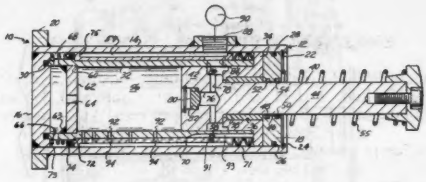
A brake disk connected to rotate with a shaft is confined between a mounting plate and an armature plate. In one embodiment, the disk is fixed to the shaft. In another and preferred embodiment, the disk floats and may be clamped between said plates. The mounting plate has arms on which the armature plate is guided; a core frame connected with such arms comprises long and short straps fastened together and providing inner and outer poles between which a spool carries the magnetic winding. A compression spring engaging the shorter strap between the inner poles serves to bias the armature plate toward engagement with the brake disk. When the winding is energized the several poles attract the armature plate to release the disk.

3,605,959
ADJUSTING MEANS FOR DISC BRAKES
Earl A. Beck, Stillwater, Okla., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Sept. 15, 1969, Ser. No. 858,024
Int. Cl. F16d *65/54, 55/18*
U.S. Cl. 188—196P 3 Claims



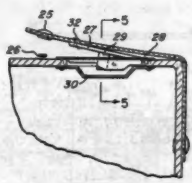
A disc brake having a caliper assembly straddling a portion of the periphery of a rotatable disc and including piston means slidably supported by the caliper to bring a brake shoe into frictional engagement with the disc. The piston means incorporating an automatic adjusting device for taking up slack and wear in the brake linings. The adjusting device is an extensible assembly that is interposed between the piston and the brake shoe to maintain a substantially constant piston stroke and cylinder chamber.

3,605,960
AUTOMATICALLY ADJUSTABLE SHOCK ABSORBERS
Jerome R. Singer, 9916 Nottingham, Detroit, Mich. 48224
Filed May 27, 1969, Ser. No. 828,168
Int. Cl. F16f *9/50*
U.S. Cl. 188—287 20 Claims



A fluid pressure shock absorber of the type having a cylinder with a piston slidably mounted therein separating the cylinder into variable volume chambers, the piston movement decreasing the size of one of the chambers in response to the shock load exerted thereon creating a pressure in such chamber which is a function of the shock load. A plurality of spaced apart ports in the cylinder connect the chambers through which fluid is forced from one chamber to the other wherein the rate of said fluid flow controls deceleration of the piston as a shock load is dissipated; and including means for automatically varynig the rate of fluid flow through the ports as a function of a pressure force in said one chamber.

3,605,961
LUGGAGE MEMBER
Dennis S. Marrion, Chester, Va., assignor to Seward Luggage Manufacturing Company, Inc., Petersburg, Va.
Filed Aug. 12, 1969, Ser. No. 849,419
Int. Cl. A45c *13/10*
U.S. Cl. 190—41R 6 Claims

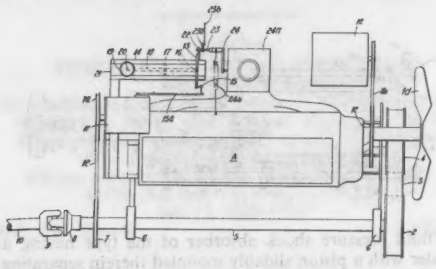


Luggage member formed of two engageable sections with latches mounted on the top wall of one section and engaging the other section. The strap is mounted on the latch in such a manner that lifting a free end of the strap releases the latch. The free end is mounted either on the same wall or on an angularly adjacent side wall, and the opposite end of the latch is fixed to the top or side wall.

3,605,962
ELECTRIC CLUTCH AND ENGINE GOVERNOR CONTROLS FOR POWER TAKE-OFF
Edwin James Maynard, Thornhill, Southampton, England, assignor to A. C. Morrison (Engineers) Limited, Southampton, England
Filed Dec. 29, 1969, Ser. No. 888,353
Claims priority, application Great Britain, Oct. 22, 1969, 51,831/69
Int. Cl. F16d *47/00*
U.S. Cl. 192—.092 5 Claims

An auxiliary power take-off apparatus for use with an internal combustion engine comprising an electromagnetic clutch through which a drive is transmitted from the

engine to a take-off shaft, a governor driven by the take-off shaft, a control device movable into and out of an operative position and responsive to the governor, a setting device movable to set the control in and out of an operable position, the control device having a cam element engageable with the fuel intake control of the engine



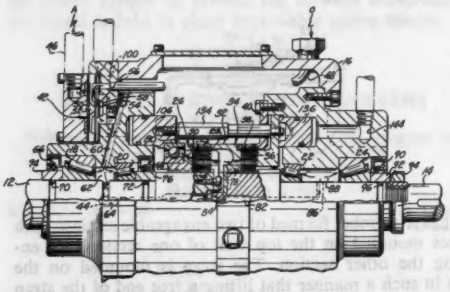
in the operative position, and an electric circuit energised by a battery or generator current and including a master switch, and an electric element of the clutch and of the setting device. A locking device responsive to gear ratio change in the vehicle drive transmission and actuating a switch in said circuit to break the circuit when the transmission is not in neutral condition.

3,605,963

MIST LUBRICATING AND COOLING APPARATUS FOR A TORQUE-TRANSMITTING MECHANISM

Ellwood L. Roob and Alfred Penko, Parma, and William W. Lyth, Cleveland, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Feb. 3, 1970, Ser. No. 8,178
Int. Cl. F16d *67/04, 13/74*
U.S. Cl. 192—18A **9 Claims**



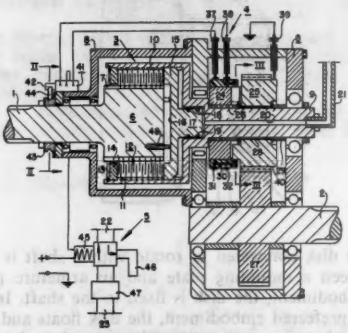
A torque-transmitting mechanism for transmitting torque between a pair of relatively rotatable members includes friction discs drivingly connected to one of the relatively rotatable members and other friction discs drivingly connected to the other relatively rotatable member. Means is provided to cool and lubricate the friction discs when torque is transmitted thereby. The torque-transmitting mechanism also includes means for moving the friction discs into frictional engagement to effect the transmission of torque between the relatively rotatable members. The means for cooling and lubricating the friction discs includes a mist generator for generating a mist and means defining a passageway for conducting the mist from the mist generator to the friction discs to effect lubrication and cooling thereof.

3,605,964

AUTOMATICALLY REVERSING FREE-WHEEL CLUTCH

Sven O. I. Jonsson, Storebro, and Bertil R. Jonsson, Vimmerby, Sweden, assignors to Vallakra Mekaniska Verkstad, Vimmerby, Sweden

Filed Nov. 24, 1969, Ser. No. 879,437
Claims priority, application Sweden, Nov. 26, 1968, 16,085/68
Int. Cl. F16d *25/063*
U.S. Cl. 192—40 **10 Claims**



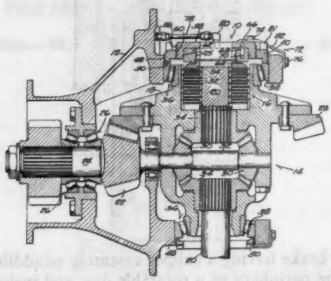
A normally disengaged fluid pressure engaged clutch is between a power take-off shaft connected to a tractor engine and a driven shaft connected to trailer wheels. When the tractor wheels slip, the speed of the power shaft becomes greater than the speed of the driven shaft, thus closing switch means on a lost motion coupling in the driven shaft. The switch means opens a solenoid valve to supply fluid pressure to the clutch for engaging it whereby the engine drives the trailer wheels for additional traction. A reversing switch senses the direction of rotation of the power shaft and automatically renders the device operative in either direction of rotation. A manual override switch permits the clutch to be selectively engaged at any time.

3,605,965

MOUNTING FOR ANNULAR PISTON IN DIFFERENTIAL LOCKUP ASSEMBLY

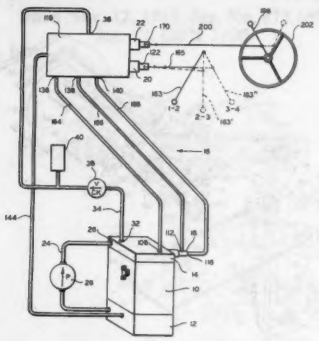
David A. Thomas, Clintonville, and Dennis T. Crowe, Oshkosh, Wis., assignors to FWD Corporation, Clintonville, Wis.

Filed Dec. 29, 1969, Ser. No. 888,777
Int. Cl. F16d *25/06*
U.S. Cl. 192—85C2 **1 Claim**



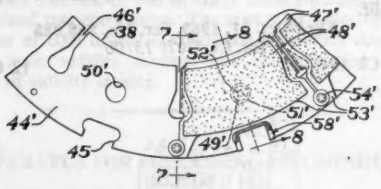
An annular piston and cylinder assembly positioned to apply pressure to the discs of a lockout clutch for a differential gear set with the annular cylinder for the assembly having a screw thread on its outer periphery for mounting in the differential gear housing in a threaded bore concentric with the axis of the clutch and located in a plane normal to the axis of the clutch.

3,605,966
TRANSMISSION CONTROL SYSTEM
William C. Erdman, Tampa, Fla., assignor to Clark Equipment Company
Continuation-in-part of application Ser. No. 783,373, Dec. 12, 1968. This application May 25, 1970, Ser. No. 40,181
Int. Cl. F16d *25/00*; F16h *3/08*; F17k *1/00*
U.S. Cl. 192—87.18 4 Claims



A multiple speed ratio gear transmission with a control system for selecting different pairs of clutches for engagement and alternating engagement of the pair of clutches selected for engagement.

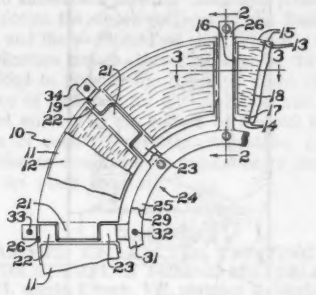
3,605,967
PROTECTIVE BEARING MEMBER FOR BRAKE OR CLUTCH
John H. Warren and Marvin E. Hotchkiss, Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.
Filed Apr. 7, 1969, Ser. No. 813,977
Int. Cl. F16d *13/64*
U.S. Cl. 192—107R 2 Claims



A protective bearing member for a brake which is suitable for very high energy service such as on aircraft and has rotors and stators of a lightweight frangible heat absorbing material. The protective bearing members are of a wear-resistant durable material and are mounted in slots in the peripheral edges of the stators and rotors for sliding engagement with keys or splines of the supporting members and for torque transmitting engagement with the stators and rotors.

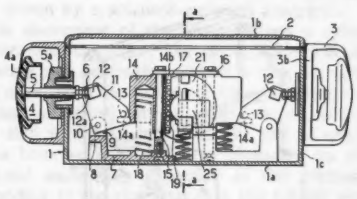
3,605,968
SEGMENTED FRICTION MEMBER FOR BRAKE OR CLUTCH
William Edwin Ely, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed Sept. 18, 1969, Ser. No. 859,059
Int. Cl. F16d *13/64, 65/12*
U.S. Cl. 192—107R 7 Claims

An annular segmented friction disc member for use as a rotor or stator in a disc-type brake or clutch assembly in which a plurality of circumferentially spaced-apart heat-absorbing segments are held between pairs of segmental facing members. Each facing member has circumferential extensions at the ends which overlap the



extensions of adjacent facing members and are retained by radial members connected to an annular ring providing a unitary disc structure.

3,605,969
TWO HAND SAFETY DEVICE
Marcel Cornu, Rueil, and Serge Terpin, Nanterre, France, assignors to La Telemecanique Electrique (Societe Anonyme), Nanterre, France
Filed Sept. 15, 1969, Ser. No. 857,898
Claims priority, application France, Sept. 27, 1968, 167,814
Int. Cl. F16p *3/18*
U.S. Cl. 192—131R 3 Claims

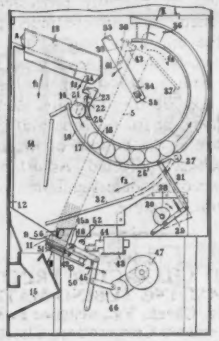


In a safety control for an intermittently operated press and the like, two elongated slide blocks reciprocally mounted on two respective guide blocks, two elongated racks integrally mounted on the respective slide blocks, a toothed wheel mounted for reciprocating translation along the racks and an actuating member integrally mounted on said wheel and cooperating with the clutch of the press only when the slide blocks are simultaneously operated.

3,605,970
COIN RECEIVING AND REIMBURSING APPARATUS
Edouard de Crepy, Paris, France, assignor to Societe Anonyme Francaise des Appareils Automatiques Taximetre-Taxiphone, Paris, France
Filed Feb. 17, 1970, Ser. No. 12,014
Claims priority, application France, Feb. 18, 1969, 6904035
Int. Cl. G07f *1/00*
U.S. Cl. 194—1 10 Claims

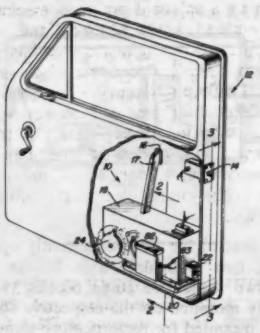
An apparatus for receiving and paying back coins, characterized in that it comprises at least one vertical plate having formed on its front face a storage channel of arcuate configuration, so that the coins inserted by the user into the apparatus can fall into the lower portion of this channel and accumulate therein, a movable mem-

ber associated with said channel and adapted to push the coins accumulated in said storage channel towards a hole formed in said plate at the upper end of said



channel, said hole being lined with a diverting member adapted to direct the coins towards a position overlying the upper orifice of an inclined tube disposed in close proximity of the rear face of said plate and wherein the coins to be delivered for reimbursement purpose are accumulated.

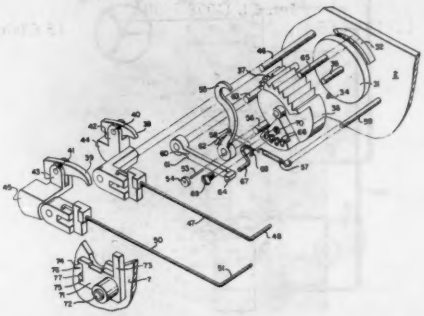
3,605,971
TAXICAB FARE BANK
Corry L. Forehand, 2106 Maryland Ave. NE., Apt. 12, Washington, D.C. 20002
Filed Mar. 14, 1969, Ser. No. 807,379
Int. Cl. G07f 5/10
U.S. Cl. 194—9 **4 Claims**



A fare receptacle is housed within a vehicle door. A slot disposed on the exterior door panel permits the insertion of fare money therein. Upon deposit of the proper fare, the vehicle door is opened thereby permitting passenger entrance. Further, a security timer is connected to a money return door in the receptacle thereby permitting retrieval of deposited fare money only at a particular time of day.

3,605,972
STEPPER AND CHANGE DISPENSER FOR A COIN CHANGER
Wilson M. Stewart, Ottawa, Ontario, Canada, assignor to Vendall Machines Limited, Ottawa, Ontario, Canada
Filed July 8, 1969, Ser. No. 839,857
Claims priority, application Canada, May 9, 1969, 51,101
Int. Cl. G07f 11/00
U.S. Cl. 194—10 **7 Claims**

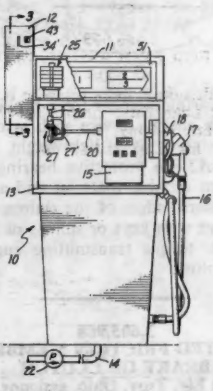
A stepper for a coin changer comprises a ratchet wheel having a switch actuating pin mounted thereon. The ratchet wheel is biased to an initial position and is moved therefrom by coin-operated dogs. It is held against premature return movement by a spring-urged pawl. A roller mounted on the ratchet wheel pushes the pawl away as the ratchet wheel is moved the last step required to initiate a vend cycle. A latch bar holds the pawl away to allow the wheel to return to its initial position. As the wheel does so, a trip member thereon strikes a release



member which lifts the latch bar to allow the pawl to re-engage the wheel.

Change is dispensed, when required, by an apertured slide reciprocable to receive change from tubes and deliver it to a change chute. A spring rod is incorporated in the drive to the slide so that the motor for driving the slide may operate even when the slide is stuck and the slide may be reciprocated by hand without actuating the motor.

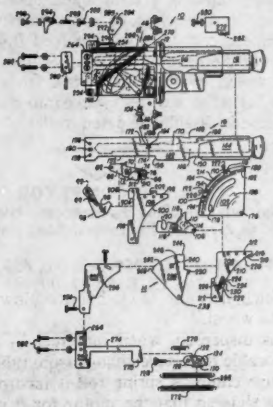
3,605,973
COIN-ACTUATED FLUID-DISPENSING SYSTEM WITH SEPARATE REGISTERS FOR COINS RECEIVED AND FLUID DISPENSED
William F. Burke, Westminster, Harry R. Rothschild, Santa Fe Springs, and Robert B. Young, Littlerock, Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.
Filed Oct. 21, 1969, Ser. No. 868,088
Int. Cl. G07f 13/00
U.S. Cl. 194—13 **12 Claims**



A coin-operated system for use with conventional gasoline pumping units for coin-operated dispensing. A system which accepts a variable amount of initial payment, dispenses the full amount of gasoline paid for or any portion thereof, and pays out the exact change to the customer. A system which operates in larger monetary units

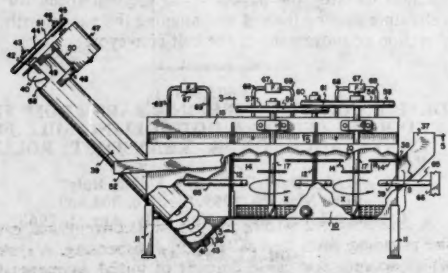
at a relatively high rate while dispensing gasoline and which operates in smaller monetary units at a relatively low rate while paying out exact change to the penny.

3,605,974
MULTIPLE COIN ACTUATING DEVICE
Jiri J. Hovorka, Oklahoma City, Okla., assignor to Pyramid Manufacturing Company, Oklahoma City, Okla.
Filed Nov. 12, 1969, Ser. No. 875,659
Int. Cl. G07f *5/00*
U.S. Cl. 194—55 **15 Claims**



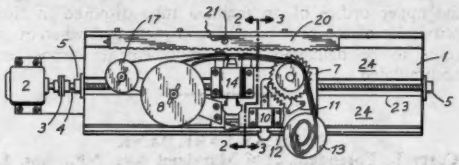
Apparatus for receiving and registering acceptance of a prescribed number and combination of coins which apparatus is readily adjustable to accept various denomination combinations of both U.S. and foreign coin monies after satisfaction of a triple verification. The apparatus consists of a coin slide member operating through a housing member which includes a metering assembly consisting of an arcuate rotor, arcuate stator and arcuate control rotor operating in coaction to sense an arcuate segmental measure of one or more coins equaling a predetermined monetary value. The apparatus relies upon a measure of coin diameter relationships to effect coin deposits upon validity sensing, and coin rejection upon failure of validity sensing.

3,605,975
APPARATUS FOR PROCESSING BITUMINOUS SANDS
Ray S. Brimhall, 4604 Idlewild Road, Salt Lake City, Utah 84117
Filed Mar. 3, 1969, Ser. No. 803,749
Int. Cl. B01d *12/00*
U.S. Cl. 196—14.52 **10 Claims**



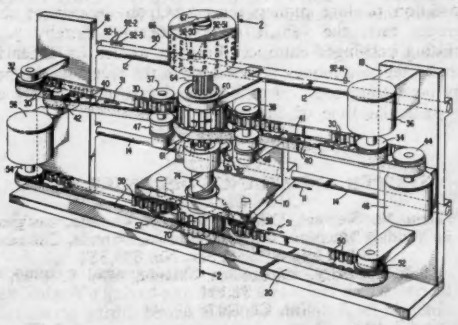
The present invention provides new and improved apparatus for processing bituminous sands to recover petroleum. The apparatus is preferably a multi-cell structure principal cells of which include bottom stirrer zones and upper quiet zones separated from the stirrer zones by baffles. Continuous through-plant feed is provided for the plant structure by partially processed sands being urged into subsequent cells for continued processing. An oil slick forms the upper surfaces of the fluid levels in each cell and the so-formed oil slick gradually spills over into a collection trough. Novel impeller or stirrer means are provided to provide the requisite, slight agitation at the bottom of each cell for oil separation and yet retain the stirred mixture at the bottom of the cell to the bottom zone of each cell affected. Adjustable gate means are provided to accommodate regulation of feed-through through the plant structure.

3,605,976
PROGRAMMED CHARACTER PRINTING MEANS FOR STAMPING TUBING MATERIAL
Lewis H. Angle, Check, Va., assignor to Methods and Improvements Corporation, Check, Va.
Filed Mar. 17, 1970, Ser. No. 20,222
Int. Cl. B41j *3/00;* **B44d** *5/00*
U.S. Cl. 197—6 **21 Claims**



A heated stationary character bar cooperates with a program moved carriage having a solenoid actuated hammer, a printing tape supply reel and tubing supply reel carried by a cantilevered arm, a printing tape take-up reel driven by a solenoid actuated mechanism in response to movement of the hammer, and a cylindrical tubing receiving container. The carriage has a depending ball bearing nut guidingly received within an upwardly opening channel on the stationary base. A reversible electric motor selectively drives a lead screw within the channel that is threaded through the nut to selectively align the hammer with a desired character on the bar for thermal embedding a portion of the printing tape corresponding to the character into the tubing, which is preferably plastic.

3,605,977
THREE-AXIS DRIVE SYSTEM
Donald Walter Janz, Framingham, and Richard Earle Seeger, Marlboro, Mass., assignor to RCA Corporation
Filed Apr. 22, 1969, Ser. No. 818,335
Int. Cl. B41j *23/04, 1/32*
U.S. Cl. 197—18 **8 Claims**



Three belt drive assemblies cooperate to selectively position a cylindrical character font carrier in a serial

printer angularly about its axis of rotation, linearly along said axis, and linearly in a direction perpendicular to said axis. These movements may occur concurrently to move any desired character on the font carrier into printing position.

3,605,978

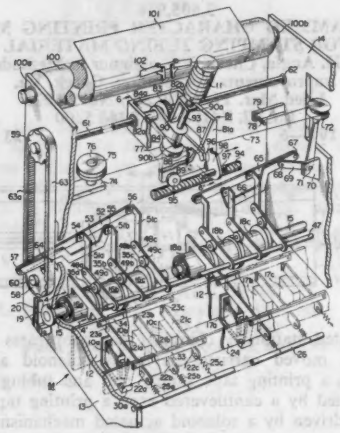
TYPE-SELECTING MECHANISM PROVIDING VISIBILITY OF PRINTED CHARACTERS DURING FUNCTION OPERATIONS

Reijiro Kawano, Tokyo, Japan, assignor to Kurosawa Tele-Communications Limited, Tokyo, Japan

Continuation-in-part of application Ser. No. 761,518, Sept. 23, 1968. This application Feb. 25, 1970, Ser. No. 14,134

Int. Cl. B41j *1/40*

U.S. Cl. 197—55 **3 Claims**



A typewriting mechanism comprising a selectively positioned type head in its longitudinal and/or in its rotary or lateral direction by means of selective lever assemblies electromagnetically operated by being supplied with coded binary signals, means being provided for receding the type head from its selected working position to its most convenient position for the necessary observation of already typewritten sentences on the typewriting paper under use, when at least a group of binary selection signals has been received.

3,605,979

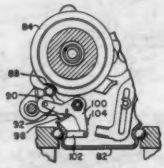
LINE INDICATOR FOR TYPEWRITER PLATENS

Hugh St. Lawrence Dannatt, Rochester, N.Y., assignor to The Singer Company

Original application Apr. 27, 1967, Ser. No. 634,223, now Patent No. 3,474,889, dated Oct. 28, 1969. Divided and this application Oct. 30, 1968, Ser. No. 798,236

Int. Cl. B41j *29/42*

U.S. Cl. 197—55 **3 Claims**



A typewriter platen has a card line indicator connected thereto which includes a detent ring having a single detent notch in its periphery which is sensed during platen rotation by a detent roller mounted on the carriage. The detent ring, for the purpose of relative rotational adjustment of the detent ring and card clamp, is made rotatable independently of the platen by mounting it on the line spacing ratchet for rotation with the latter. Release of a line spacing ratchet clutch permits the rotation of the platen without affecting the line spacing ratchet and the detent ring, allowing the notch in the latter to be first rotated into detented position as the platen is rotated and the subsequent rotation of the platen and card clamping bar alone to a desired line position. Whenever, thereafter, the detent roller enters the detent notch, it will be an indication to the operator that a predetermined line of a card held by the card clamp is in proper typing position. The additional torque provided by registration of the detent and detent notch, while producing a clear signal that a desired line position has been reached, is not sufficient to interfere with subsequent conventional line feed functions.

The detent roller is mounted on a pivoted, spring-biased, bellcrank carried by the carriage. A latch finger at one end of the bellcrank can be swung into contact with the carriage frame to disable the detent roller.

3,605,980

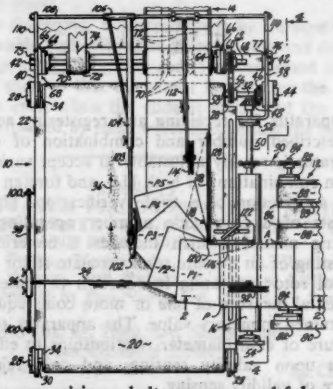
TURNING CONVEYOR

Leo O. Donahue and Roy E. Behrens, Highland, Calif., assignors to Graphic Engineers, Inc., San Bernardino, Calif.

Filed Aug. 12, 1969, Ser. No. 859,608

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 **10 Claims**



Apparatus comprising a belt conveyor and fulcrum device for receiving a line of overlapping "shingled" papers from a delivery conveyor and transporting them around a right-angle corner, during which the papers fan out and then return to shingle condition. The papers are propelled onto the belt conveyor in sequence to dispose at least the leading half of each paper ahead of the corner, whereupon the pull of the belt conveyor initiates turning of the paper thereabout. Means are provided for pressing the papers against the belt conveyor for better traction to bring the papers up to the belt speed for accelerating turning thereof and aligning the papers with the direction of movement of the belt conveyor.

3,605,981

DEVICE FOR TRANSFERRING BARS FROM THE COOLING BED OF A HOT ROLLING MILL FOR CONVEYANCE ON A TRANSPORT ROLLER PATH

Luigi Danieli, Buttrio, Udine, Italy

Filed Mar. 20, 1969, Ser. No. 808,839

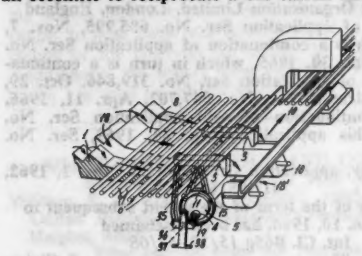
Claims priority, application Italy, Apr. 2, 1968, 14,716/68

Int. Cl. B65g *47/00*

U.S. Cl. 198—27 **6 Claims**

A device for transferring bars from the cooling bed of a hot rolling mill to a transport roller path includes an

articulated quadrilateral or four-bar linkage arrangement. The four-bar linkage arrangement is actuated by an eccentric to reciprocate a bar carrier through forward



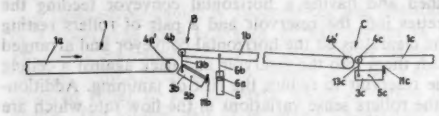
and return strokes. A plurality of bars are transferred from the cooling bed to the transport path on each forward stroke of the carrier.

3,605,982

APPARATUS FOR DISTRIBUTING OBJECTS

Michael Adler, Forchheim, Germany, assignor to Maschinenfabrik Loesch GmbH, Forchheim, Germany

Filed Apr. 2, 1970, Ser. No. 24,990
Claims priority, application Germany, Apr. 2, 1969, P 19 17 062.8
Int. Cl. B65g 47/26
U.S. Cl. 198—30 **11 Claims**



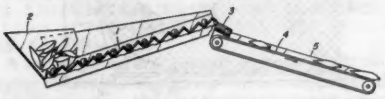
The invention provides an apparatus for distributing objects, comprising a main conveyor which views objects such as chocolate bars, to be distributed. The main conveyor comprises a plurality of main conveyor sections. The main conveyor sections are in generally horizontal alignments with one another. A plurality of feed conveyors are supported horizontally transversely of the main conveyor adjacent front ends of the associated ones of said main conveyor sections. Means are provided for tilting said feed conveyors about an axis transverse to the main conveyor so that the front edge of said feed conveyors are brought substantially to the level of the preceding main conveyor sections and means are provided for simultaneously pivoting said respective main conveyor sections to bring said front ends of said main conveyor sections out of alignment in the said preceding sections.

3,605,983

CORN ORIENTING APPARATUS AND METHOD

Charles George Peter Oldershaw, Avon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Aug. 14, 1969, Ser. No. 850,188
Int. Cl. B65g 47/24
U.S. Cl. 198—30 **10 Claims**



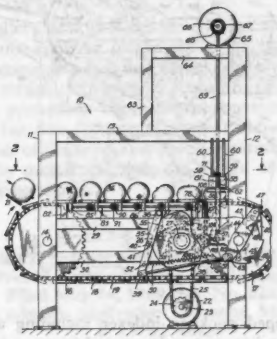
An apparatus for orienting tapered agricultural products such as corn so that the products are discharged from the apparatus with their larger diameter end forward.

3,605,984

APPARATUS FOR ORIENTING CORE-BEARING FRUIT

Arthur B. Erekson, Scarsdale, N.Y., and Malcolm S. Lane, Baltimore, Md., assignors to Borden, Inc., New York, N.Y.

Filed July 7, 1969, Ser. No. 840,605
Int. Cl. B65g 47/24
U.S. Cl. 198—33AA **3 Claims**



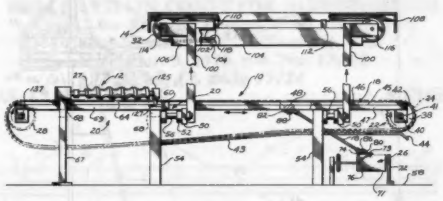
This invention relates to the method of and apparatus for orienting core-bearing fruit and comprises a cell having an opening, said cell adapted to receive core-bearing fruit, rotation wheels mounted for movement through said opening to subject said fruit to multi-axial rotation out of contact with said cell whereby said core is aligned in a vertical axis.

3,605,985

APPARATUS AND PROCESS FOR TRANSPORTING ARTICLES FOR LABELING AND THE LIKE

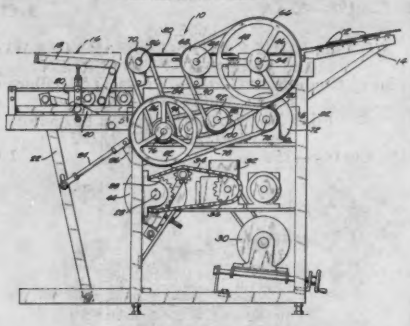
Thomas E. Ellison, Pasadena, Calif., assignor to Biner-Ellison, Los Angeles, Calif.

Filed Aug. 1, 1969, Ser. No. 846,773
Int. Cl. B65g 47/26
U.S. Cl. 198—34 **17 Claims**



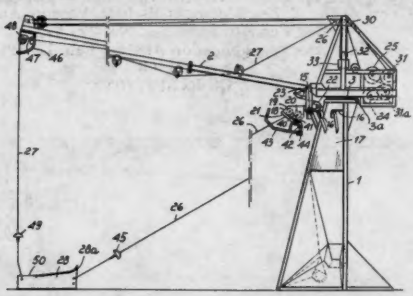
An endless conveyor transports articles to be labeled from an input station to an output station and, while transporting the articles, stops the articles at a labeling station. The conveyor is in continuous motion. At selected times, the conveyor is moved at a rate equal to but opposite in direction from its conveying speed. When the conveyor is so moved, the relative motion between articles being conveyed and the labeling station is zero. An input feed screw stops when the relative motion of the articles at the labeling station stops to maintain proper article spacing and avoid an article jam.

3,605,986
PACKAGE INDEXER
James P. Navin, Racine, Wis., assignor to Sturtevant Industries, Inc., Sturtevant, Wis.
Filed Nov. 13, 1969, Ser. No. 876,396
Int. Cl. B65g 47/26
U.S. Cl. 198—34 8 Claims

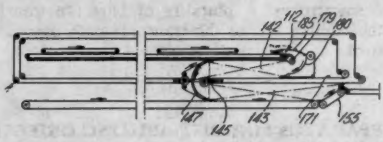


A prewrapped package indexer including a first belt type conveyor driven at a slow speed to seperate packages stacked in a shingled relation on an infeed conveyor, a second belt type conveyor to hold the package separated from the stack by the first conveyor at an intermediate position for timed delivery to a weighing and labeling device, a third belt type conveyor operating continuously at a high speed to transport the package from the second conveyor to the weighing and labeling device, and an electrical circuit to control the operation of the first and second conveyors in timed sequence with the operation of the labeling device.

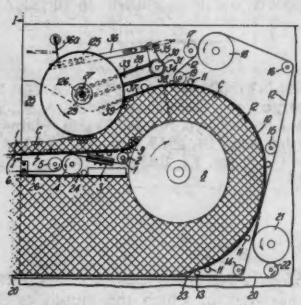
3,605,987
AUTOMATIC APPARATUS FOR CONVEYING LOOSE MATERIALS TO A UTILIZATION STATION
Franco Sigismondo, Via Montevideo 9, Milan, Italy
Filed Sept. 18, 1969, Ser. No. 859,105
Claims priority, application Italy, Sept. 23, 1968, 21,578/68
Int. Cl. B65g 65/28
U.S. Cl. 198—36 7 Claims



This disclosure relates to an automatic device for conveying loose material from a plurality of zones around the apparatus and separated by portion walls to a collection zone, said apparatus including a clamshell bucket carried by an arm mounted for rotation on the fixed framework of the apparatus, and cable means for actuating said clamshell bucket, means being provided to cause the clamshell bucket to move substantially parallel to said partition walls when material adjacent these walls is collected.

3,605,988
APPARATUS FOR FEEDING CIGARETTES
Alan Keith McCombie, London, England, assignor to The Molins Organisation Limited, London, England
Continuation of application Ser. No. 685,995, Nov. 7, 1967, which is a continuation of application Ser. No. 491,672, Sept. 30, 1965, which in turn is a continuation-in-part of application Ser. No. 319,846, Oct. 29, 1963. Application Ser. No. 547,702, Apr. 11, 1966, being a continuation of said application Ser. No. 319,846. This application Aug. 28, 1969, Ser. No. 854,028
Claims priority, application Great Britain, Nov. 1, 1962, 41,395/62
The portion of the term of the patent subsequent to Jan. 10, 1984, has been disclaimed
Int. Cl. B65g 15/22, 43/08
U.S. Cl. 198—37 5 Claims

Conveying apparatus for cigarettes, especially tipped cigarettes, having an expansible reservoir through which the cigarettes are conveyed in a continuous stack by means of conveyor belts and rollers between which the stack is confined and having a horizontal conveyor feeding the cigarettes into the reservoir and a pair of rollers resting on the cigarettes on the horizontal conveyor and arranged to push them into the reservoir and pack against a ceiling of the reservoir to reduce the risk of jamming. Additionally the rollers sense variations in the flow rate which are used to control the capacity of the reservoir.

3,605,989
APPARATUS FOR FEEDING CIGARETTES
Alan Keith McCombie, 2 Evelyn St., Deptford, London, SE. 8, England
Division of application Ser. No. 854,028, Aug. 28, 1969, which is a continuation of application Ser. No. 685,995, Nov. 7, 1967, which is a continuation of application Ser. No. 491,672, Sept. 30, 1965, which in turn is a continuation-in-part of application Ser. No. 319,846, Oct. 29, 1963. Application Ser. No. 547,702, Apr. 11, 1966, being a continuation of said application Ser. No. 319,846. This application Nov. 20, 1970, Ser. No. 91,313
Int. Cl. B65g 15/14
U.S. Cl. 198—76 20 Claims



Conveying apparatus for cigarettes, especially tipped cigarettes, having an expansible reservoir through which the cigarettes are conveyed in a continuous stack by

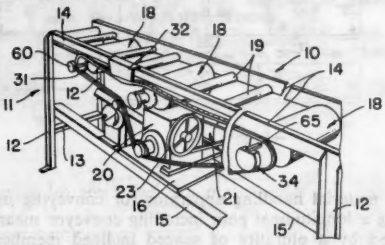
means of conveyor belts and rollers between which the stack is confined and having a horizontal conveyor feeding the cigarettes into the reservoir and a pair of rollers resting on the cigarettes on the horizontal conveyor and arranged to push them into the reservoir and pack against a ceiling of the reservoir to reduce the risk of jamming. Additionally, the rollers sense variations in the flow rate which are used to control the capacity of the reservoir.

3,605,990

SHAFT DRIVER DEVICE AND CONVEYOR SYSTEM EMBODYING THE SAME

William E. Cowen, Jr., Westland, Mich., assignor to United Industrial Engineering Corporation, Madison Heights, Mich.

Filed Jan. 17, 1968, Ser. No. 698,533
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 **10 Claims**



A shaft driver device is disclosed for use, illustratively, in a roller-type load conveyor or like system in which load units are halted for the performance of an operation thereon, with a consequent increased drag on a normally powered roller of the conveyor which is driven by the device. The system and drive device incorporate means which acts quite independently of any control factor, other than the drag effect, to interrupt the drive of the conveyor roller, or equivalent element in a different installation, immediately upon the arising of drag in excess of a critical value, restoring the drive when that value diminishes or the drag ceases. The drive control means referred to is built in its entirety into the structure of a driven roller or other shaft-driven component comparable thereto.

More specifically, the system comprises a first hub member normally rotating with the driver shaft and powered from an appropriate source, a second hub member coaxial with the first member, and means in the form of a torsion spring clutch device normally coupling said members for rotation as a unit under a drag load less than the cirtical value. The first member is shown as having a resilient driving connection to the second member which, on excess load, yields and causes the torsion spring coupling means to be de-clutched, the shaft drive then coming to a halt. This drive connection is adjustable as to its resilient bias to determine the critical value.

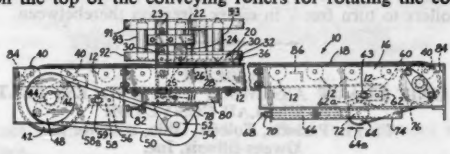
3,605,991

CONVEYING APPARATUS

Harold S. Burt, Wilmette, and Raymond E. Derflinger, Chicago, Ill., assignors to Conveyor Systems, Inc., Morton Grove, Ill.

Filed Aug. 11, 1969, Ser. No. 848,869
Int. Cl. B65g *13/07*
U.S. Cl. 198—127R **1 Claim**

A roller conveying apparatus having a plurality of conveying rollers for conveying articles supported thereon in a given direction, the conveying rollers being mounted for rotation about axes perpendicular to the direction in which the articles are conveyed, each of the conveying rollers having an article carrying portion and a belt receiving portion on the top thereof. There is provided an endless power transmission belt having an active run and a return run, the active run engages the belt receiving portion on the top of the conveying rollers for rotating the con-



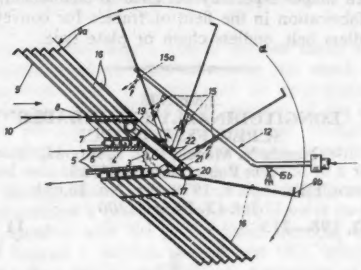
veying rollers and driving the articles therealong, and belt pressure applying means above the active run of the power transmission belt and comprising a number of belt engaging means resting under force of gravity on the belt at points preferably between the conveying rollers and mounted for free floating movement above the belt, the drive power of the roller conveying apparatus being readily adjusted by merely changing the weight of said belt pressure applying means.

3,605,992

APPARATUS FOR DRYING PRINTED SHEETS

Erich Weber, Eichgrabenweg 2, Feldafing, Germany

Filed May 14, 1969, Ser. No. 824,521
Claims priority, application Germany, May 15, 1968, P 17 61 401.6
Int. Cl. B65g *17/12, 17/46;* B65h *29/00*
U.S. Cl. 198—134 **9 Claims**



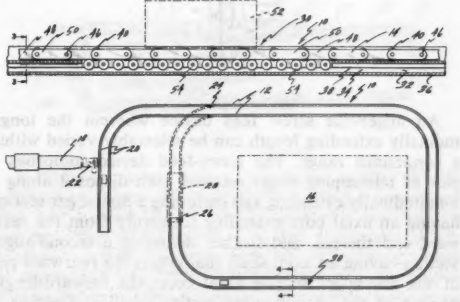
A printed sheet drying apparatus of the type comprising inclined carriers mounted on an endless moving chain with upper and lower runs is provided with a conveyor for controlled lowering of the sheets from the upper run to the lower run. Suction and/or blowing devices are provided for holding the sheets on the conveyor.

3,605,993

ROLLER CHAIN CONVEYOR ACCUMULATOR

Carl C. De Rozario, Denver, Colo., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

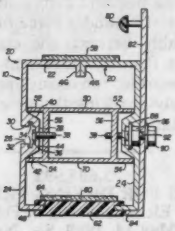
Filed Mar. 9, 1970, Ser. No. 17,798
Int. Cl. B65g *17/24*
U.S. Cl. 198—183 **8 Claims**



This invention relates to an accumulator section for a roller chain conveyor run wherein the connecting links

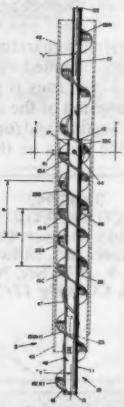
pivotally interconnecting adjacent rollers of the chain for rotational movement are supported on both sides by a series of stationary idler rollers that permit the chain rollers to turn freely in either direction therebetween.

3,605,994
UNIT FRAME ASSEMBLY FOR ENDLESS BELT OR SIMILAR CONVEYOR
Carl L. Parlette, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 26, 1970, Ser. No. 22,861
Int. Cl. B65g *15/60*; E04c *3/30*; F16b *1/00*
U.S. Cl. 198—204 **5 Claims**



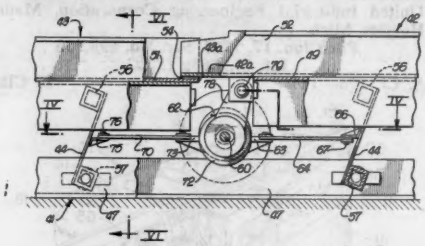
A unit frame assembly is constructed from elongate extruded shapes especially designed to enable simple and rapid fabrication in the field of frames for conveyors of the endless belt, endless chain or plate type.

3,605,995
LONGITUDINALLY EXTENDABLE SCREW FEED DEVICE
Norris N. Maack, R.R. 3, Box 66, West Point, Nebr. 68788
Filed Apr. 8, 1970, Ser. No. 26,651
Int. Cl. B65g *33/00*
U.S. Cl. 198—213 **11 Claims**



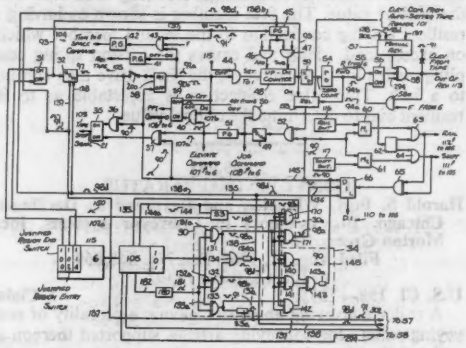
An auger-like screw feed device wherein the longitudinally extending length can be selectably varied within a continuous range. The screw-feed device comprises a pair of telescoping auger sections each disposed along a longitudinally extending axis including a first-auger section having an axial bore extending forwardly from the rearward end thereof, and further including a second-auger section having an axial shaft that enters the rearward end of the first-auger section axial bore; the forward-length portion of the second-auger section's helical flighting is radially spatially separated from the second-auger axial shaft whereby rotation of the second-auger axial shaft about the longitudinal axis allows telescoping relative movement between the pair of auger sections, to attain the selected length for the screw feed device.

3,605,996
MATERIAL HANDLING APPARATUS AND MEANS TO IMPART VIBRATORY FORCES THERETO
Lee B. Holman, Whittier, Calif., assignor to State Steel Products, Inc., City of Industry, Calif.
Filed June 25, 1969, Ser. No. 836,527
Int. Cl. B65g *27/00*
U.S. Cl. 198—220CB **6 Claims**



A material handling apparatus for conveying material along a longitudinal path including conveyor means supported by a plurality of spaced inclined members and means to actuate or impart vertical and longitudinal force components to material being conveyed along said path. Actuating means includes a resilient member, such as a flexible driven leaf having an eccentric connection to a driven rotatable shaft and having a transverse connection to the adjacent inclined support member. The driven rotatable shaft may be mounted on a base frame means or may be floatably mounted from the conveyor means, the apparatus including a stabilizing means carried by the conveyor means for the floatably mounted rotatable shaft.

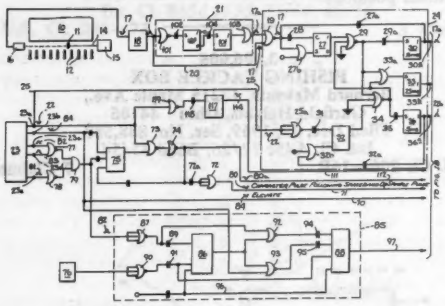
3,605,997
AUTOMATIC JUSTIFICATION OF LINE-CASTING MACHINE
David J. Sinnott, Ringwood, N.J., assignor to Star-New Era, Inc., South Hackensack, N.J.
Continuation of abandoned application Ser. No. 678,324, Oct. 26, 1967. This application Mar. 2, 1970, Ser. No. 14,793
Int. Cl. B41b *9/06*; B41j *5/36*
U.S. Cl. 199—18 **9 Claims**



A line-casting machine is operated by an automatic setting mechanism. The automatic setting mechanism is actuated by a tape reader sensing codes on a tape. An au-

tomatic justifying mechanism is also connected to the reader and the automatic setting mechanism for determining if an assemblage of matrices by the line-casting machine is justifiable. The apparatus takes into consideration the completion of a syllable in the justified region that could be hyphened. Each word is syllabized with a hyphen between the syllables, which is an artificial one. The artificial hyphen is sensed by the tape reader and is applied to the electronic circuit to determine if the assembled matrices will justify. The artificial hyphen is impressed on the automatic setting mechanism only in the justified region.

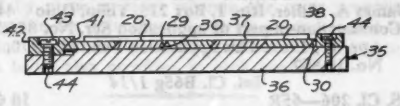
3,605,998
ELECTRICAL APPARATUS FOR COMPARING DROPPED MATRICES WITH REQUESTED MATRICES OF A LINE-CASTING MACHINE
David J. Sinnott, Ringwood, N.J., assignor to Star-New Era, Inc., South Hackensack, N.J.
Continuation of application Ser. No. 694,732, Dec. 29, 1967. This application Mar. 11, 1970, Ser. No. 18,004
Int. Cl. B41b *9/06*
U.S. Cl. 199—18 **8 Claims**



Logic circuits are connected to an automatic apparatus for operating a line-casting machine from a coded tape and connected to a photocell for sensing the dropping of the matrices in response to the automatic equipment. Signals from a photocell assembly count the dropped matrices and signals from the electronic equipment are impressed on a selection circuit so that one signal is held while the other signal is impressed on an up/down counter. The count detector is provided to read the counter to determine if all the matrices requested are dropped. If a proper comparison is not made, the machine is stopped. The comparison may be made at the end of each word and at the end of each line. An electronic unit is connected to the means sensing the dropping of the matrices to create a simulated signal when two overlapping matrices provide for a single interruption of the light beam projected to the photocell.

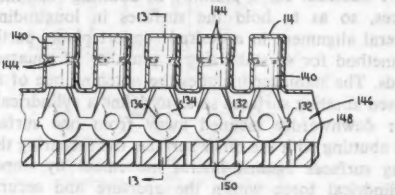
3,605,999
INSULATIVE COATED METAL SUBSTRATES AND APPARATUS FOR HOLDING SUBSTRATES
Seneca G. Coon, Jr., Glendora, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed July 23, 1969, Ser. No. 844,104
Int. Cl. B65d *73/02, 85/54, 85/62*
U.S. Cl. 206—1R **8 Claims**

A substrate according to this disclosure comprises a metallic sheet having an insulative layer on one surface thereof for supporting a microcircuit. The substrates preferably have beveled edges so that similar substrates may be positioned in apparatus whereby the beveled side edges of the substrates react against beveled edges of a slot in the apparatus and beveled edges of contiguous substrates



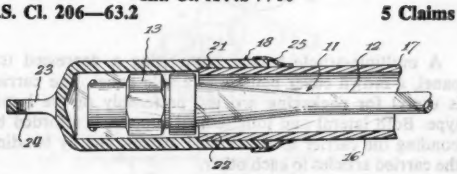
react against each other to hold all of the substrates in place.

3,606,000
THERMOFORMED PLASTIC COVERED CONNECTORS
Joseph Agusta Wise, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed July 3, 1968, Ser. No. 742,427
Int. Cl. B65d *69/00, 73/02*
U.S. Cl. 206—56 **1 Claim**



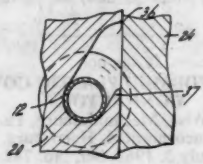
Connectors including a plastic covered metal element are manufactured by thermoforming flat stock plastic sheet material onto a mandrel of an appropriate configuration and then cutting away portions of the formed sheet to provide an article of a desired configuration. The mandrel is made to carry the metal element which is locked into the plastic covering by reason of a vacuum drawn through holes in the mandrel during forming. In one embodiment a preformed metal element is itself used as the mandrel with the plastic sheet material thermoformed around a portion thereof and then trimmed to provide a final article configuration. Assemblies of plastic covered elements are provided by leaving a portion of the thermoformed strip as a web between individual elements or alternatively, thermoforming insulating sheet material onto strips of metal elements joined by a web of sheet metal stock from which the elements were initially formed.

3,606,001
CARDIAC CATHETER PACKAGE
Daniel A. Talonn, St. Louis, and John K. Cook, Overland, Mo., assignors to Sherwood Medical Industries Inc.
Filed June 26, 1968, Ser. No. 740,261
Int. Cl. A44b *7/00*
U.S. Cl. 206—63.2 **5 Claims**



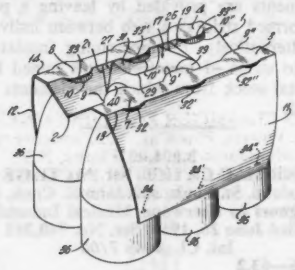
A cardiac catheter package including a cardiac catheter having a relatively stiff body provided with a turned portion, and a relatively stiff container loosely receiving the catheter. The container has a turned configuration substantially conforming to the catheter configuration whereby the turned body of the catheter is freely received in the container in its use configuration thereby preventing undesirable bending and kinking of the catheter and facilitating use thereof in cardiac catheter insertions.

3,606,002
STABILIZER FOR A PLURALITY OF ABUTTING RECTILINEAR SURFACES
James A. Miller, Rte. 1, Box 225, Tiffin, Ohio 44883
Continuation-in-part of application Ser. No. 816,205, Apr. 15, 1969. This application Feb. 12, 1970, Ser. No. 10,857
Int. Cl. B65g 1/14
U.S. Cl. 206—65R 10 Claims



A stabilizer for a plurality of abutting rectilinear surfaces, so as to hold the surfaces in longitudinal and lateral alignment in a desired support plane, particularly a method for so stabilizing a plurality of squared spool ends. The stabilizer includes the notching one of two opposed abutting surfaces so as to define a cylindrical shoulder downwardly inclined away from one surface and its abutting with the other surface, then securing the abutting surfaces against lateral movement by imposing a cylindrical force within the aperture and securing the abutting surfaces against longitudinal movement by applying opposed lateral forces radially outwardly of said aperture on both sides of said abutting surfaces.

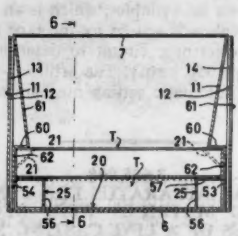
3,606,003
MULTIPLE-ARTICLE CARRIER
Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc.
Filed Mar. 17, 1969, Ser. No. 807,508
Int. Cl. B65d 71/00
U.S. Cl. 206—65E 8 Claims



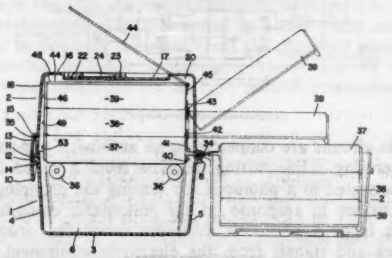
A multiple-article carrier comprising a depressed top panel, a crown cover panel and a side panel. The carrier is useful for packaging articles, preferably of the bottle type. Both lateral and longitudinal support is afforded by bonding the carrier to the carried articles and by bonding the carried articles to each other.

3,606,004
PLANT PACKAGE AND SHIPPING CONTAINER FOR POTTED PLANTS
Franz Fruehwirth, 137 Seeman Drive, Encinitas, Calif. 92024
Filed July 10, 1969, Ser. No. 840,798
Int. Cl. B65d 5/48, 85/52
U.S. Cl. 206—65R 8 Claims

A plant package including an outer container of fibreboard and a pair of superposed horizontal rows of trays supported on a fibreboard pad on the bottom of the container, each tray holding a row of potted plants therein with said trays held on said pad in spaced relation for passage of the plant stems into the upper portion of the container, and closure flaps on said container closing positions and vice versa, said flaps formed to provide horizontally-extending ledges positioned over the upper sides of the ends of the upper row of trays to lock said trays and potted plants down against movement during handling of the container when the closure flaps are secured in closed positions.



3,606,005
FISHING TACKLE BOX
Bernard Meksula, 13215 Maple Ave., Garfield Heights, Ohio 44105
Filed Dec. 29, 1969, Ser. No. 888,587
Int. Cl. A45c 11/26; B65d 85/54
U.S. Cl. 206—16R 7 Claims

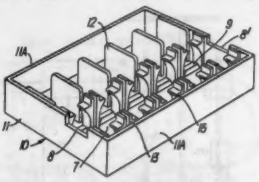


A fishing tackle box is provided comprising a box or shell and a tier of bait trays so arranged and latched to each other as to permit ready access to any tray without disturbing the other trays. The tier of trays is so disposed within the box as to permit easy access to each tray, while providing a substantial volume of space within the box for items not usually carried in the trays. A unique latching mechanism is provided which latches the trays to each other and occupies little or no space within the box.

3,606,006
PACKAGE FOR AMPOULES
Georges Raybois, Paris, France, assignor to Societe Parisienne d'Expansion Chimique S.P.E.C.I.A., Paris, France
Filed Aug. 15, 1969, Ser. No. 850,441
Claims priority, application France, Apr. 23, 1969, 6912816
Int. Cl. B65d 1/36
U.S. Cl. 206—72 2 Claims

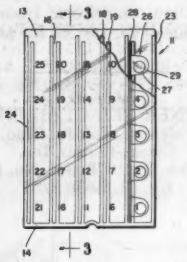
A package for pharmaceutical ampoules in the form of a rectangular box having upstanding side walls, the ampoules being retained by resilient lugs located in pairs. The lugs grip the cylindrical portions of the ampoules

only near the bottom thereof and near the neck, a space being left between the lugs. At the same location as and co-extensive with the space, slots are formed to extend downwardly from the top edge, so that a marking



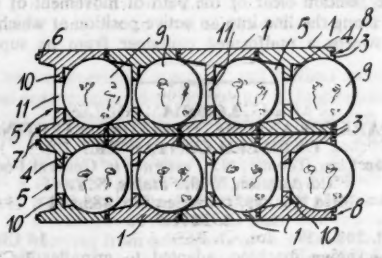
member may be moved laterally of the box, through the slots, and in contact with the ampoules, to mark them. The ampoules may be supported on bars to rotate as the marking member passes in contact therewith.

3,606,007
COMBINATION CONTAINER AND DISPENSER FOR STRIP PACKAGES
Lewis C. Huston, Jr., Granville, Ohio, assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed June 18, 1969, Ser. No. 834,320
Int. Cl. B65d *1/36, 85/00, 85/56*
U.S. Cl. 206—73 **3 Claims**



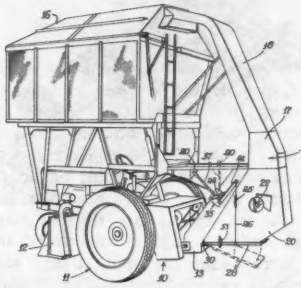
A combination container and dispenser for strip packages containing medication in individual and separable units. The combination container and dispenser has a pair of substantially vertical side walls integrally connected to a base wall with a plurality of channels disposed on the inner surfaces of the side walls for containing the strip packages.

3,606,008
COIN CONTAINER
Sergio Lusetti, Via Matilde di Canossa 17, Modena, Italy
Filed Dec. 3, 1968, Ser. No. 780,740
Claims priority, application Italy, Dec. 11, 1967, 31,110/67
Int. Cl. A45c *11/28;* **B65d** *21/00*
U.S. Cl. 206—.84 **2 Claims**



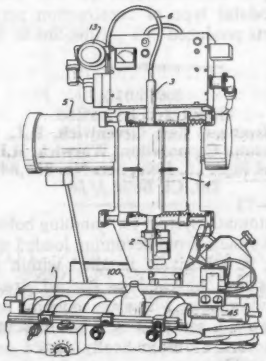
Coin container comprising an elongate body member of a substantially H-shaped cross-section wherein a first coin accommodating groove is provided, as defined by a cylindrical surface enveloping the coins at the periphery thereof for more than half the circumference thereof. The coin containers are fittable on one another to form a panel defined by plane surfaces wherein the coins accommodated within the coin accommodating groove extend into a second container slot overlapped thereto, this second groove being also provided in each container.

3,606,009
COTTON BOLL BOX CAPACITY INDICATOR
Wilbur H. Clendenin, Ava, Ill., and Wyatt T. Gable, Jr., Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.
Filed July 28, 1969, Ser. No. 845,368
Int. Cl. B07c *5/20*
U.S. Cl. 209—71 **5 Claims**



An apparatus for signaling the operator of a cotton harvester that a predetermined quantum of green cotton bolls have been collected in a boll collecting chamber of the cotton harvester, the chamber having a hinged discharge door on which collected green bolls lie, the door being biased in a closed position by a resilient member arranged to provide a closing force to the door so that the door will assume a slight predetermined displacement toward the open position when the boll chamber is filled to capacity, an electric switch disposed to sense this displacement and thereupon to actuate closing an electric circuit which energizes a signaling device placed within sensorial range of the operator.

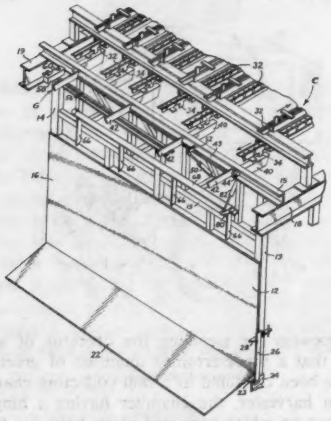
3,606,010
GAS CLASSIFIER FOR CONTAINERS
Whitney S. Powers, Pine City, N.Y., assignor to Powers Manufacturing, Inc., Elmira, N.Y.
Filed Feb. 16, 1970, Ser. No. 11,496
Int. Cl. B07c *5/34*
U.S. Cl. 209—72 **8 Claims**



Defective bottles produced by a defective mold in a multi-element molding machine are first identified by an

inspector by injecting a charge of fluid such as carbon dioxide gas. During later testing in transit, the presence of the fluid in a bottle is sampled to trigger a device for ejecting the bottle from the test line.

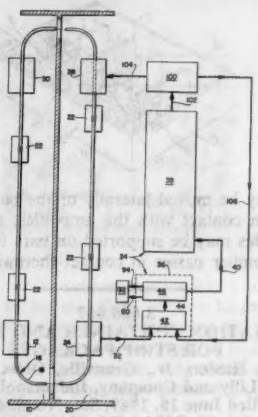
3,606,011
LUMBER SORTING METHOD AND APPARATUS
Otto G. Jeddeloh, Medford, Oreg., assignor to Oregon Cutstock and Moulding Corp., White City, Oreg.
Filed June 27, 1969, Ser. No. 837,257
Int. Cl. B07c 5/04
U.S. Cl. 209—73 **8 Claims**



A method and apparatus for sorting lumber. The method includes conveying a board laterally to a sorting station and then rapidly dropping the support from under the board whereby it falls essentially in the position it had while conveyed and without turning over on its edge. The apparatus includes a conveyer for moving boards laterally, one at a time, with conveying force imparted by contacting edges of the boards. The boards are conveyed over a horizontally disposed drop gate in a sorting station, which is hingedly mounted at its upstream margin to accommodate swinging of its downstream margin downwardly to drop a board into a bin. A motor is connected to the gate for powering its swinging movement. The apparatus also includes means at the bottom of the bin for unloading boards from the bin, and an accumulator between the gate and bottom of the bin for accumulating boards during unloading of the bottom of the bin. The apparatus features a modular type of construction permitting the number of sorts produced in a sorting line to be varied.

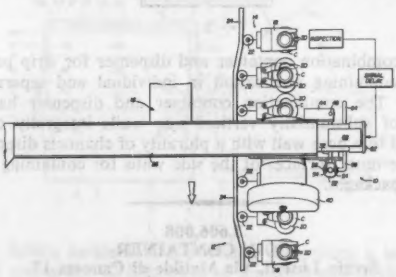
3,606,012
SORTING SYSTEM
Charles W. Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Sept. 15, 1969, Ser. No. 857,848
Int. Cl. B07c 3/14
U.S. Cl. 209—73 **10 Claims**

A closed automatic system for handling bobbins and for preventing the system from becoming loaded with bobbins which cannot be effectively handled within the system. Filled bobbins are conveyed, as needed, from a supply area to a winding area where the bobbins are prepared for unwinding on a self-tending winder. Bobbins ejected from the winder are automatically sorted and the substantially emptied bobbins are returned to the supply area. Partially filled bobbins ejected from the winder are returned to be again prepared, along with other filled bobbins, for return to the winder. However, some of the filled bobbins may, for various reasons, be in such condition that they cannot be prepared for unwinding or have not been properly prepared for use by the winder. In



order to keep the system from becoming loaded with such defective bobbins, the bobbins are inspected and bobbins not passing inspection are rejected from the system, and are deposited outside of the system for subsequent manual inspection.

3,606,013
CONTAINER REJECT MECHANISM
Luther H. Wideman, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Feb. 16, 1970, Ser. No. 11,394
Int. Cl. B07c 3/02
U.S. Cl. 209—74 **4 Claims**

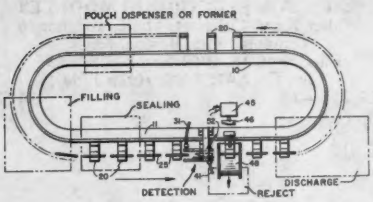


A reject mechanism for ejecting malformed containers from support forks upon which the containers are carried along a container production line. A rotating wire brush is mounted for movement from a normally maintained inactive position clear of the path of movement of containers along the line into an active position at which the brush sweeps a malformed container from its support fork.

3,606,014
APPARATUS AND METHOD FOR DETECTING UNFILLED CONTAINERS
Stephen Linn, Tenafly, N.J., assignor to General Foods Corporation, White Plains, N.Y.
Filed Dec. 15, 1969, Ser. No. 885,102
Int. Cl. B07c 5/00
U.S. Cl. 209—79 **14 Claims**

A packaging machine, adapted to grip flexible containers along one edge thereof for conveying the containers seriatim through various stations, applies a uniform impulse to each container in a direction perpendicular to the direction of conveyor travel. The impulse

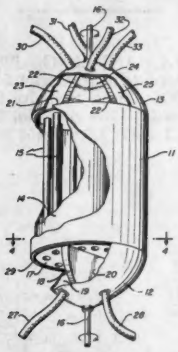
deflects each container within a predetermined time period an extent inversely proportional to the mass represented by the container and its contents. The containers which deflect a greater extent than the extent of deflection of a filled container are identified and subsequently rejected.



ERRATA

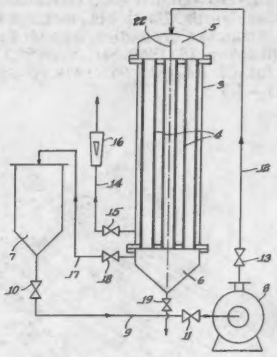
For Classes 209—318 and 210—59 see:
Patent Nos. 3,606,026 and 3,606,015

3,606,015
HEAT-REGENERATIVE SEPARATOR AND METHOD
Richard Francis Bukacek and Sanford A. Weil, Chicago, Ill., assignors to The Institute of Gas Technology, Chicago, Ill.
Filed Nov. 28, 1969, Ser. No. 880,731
Int. Cl. C02b *1/18*; F28d *17/00*
U.S. Cl. 210—59 **6 Claims**



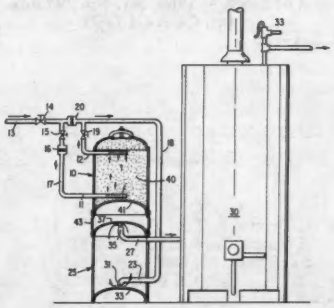
A heat-regenerative separator and method which uses a heat-regenerative element having a heat-regenerative material at phase-change temperature to impart to or receive from an imput fluid latent heat of separation thereby causing separation from said input fluid a product of a phase different than the input fluid which product will subsequently be withdrawn from the separation area in a withdrawal fluid when said heat-regenerative material receives from or imparts to said withdrawal fluid latent heat of decomposition of said product into said withdrawal fluid, said method comprising alternating passage of input fluid and withdrawal fluid in heat-exchange relation with said heat-regenerative element.

3,606,016
FILTERING METHOD AND APPARATUS THEREFOR
Jiro Sasaki, 4067–2 Nimyo-cho, Nara, Japan
Filed Dec. 18, 1969, Ser. No. 886,318
Claims priority, application Japan, May 21, 1969, 44/39,810
Int. Cl. B01d *37/04*
U.S. Cl. 210—65 **4 Claims**



A filtering method in which the filtration of impurity particles from a liquid is performed by causing the liquid and impurity particles contained therein to flow along a path having a preselected angle with respect to the longitudinal axis of a filter medium whereby impurity particles having grain sizes larger than the effective diameter of the pores of the filter medium are not able to pass through the pores, the intended degree of purification of the liquid thereby being achieved.

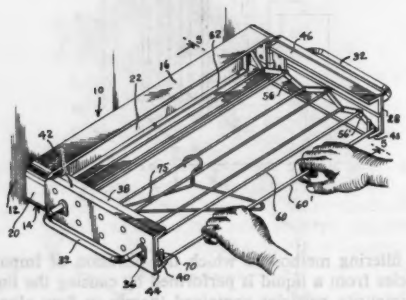
3,606,017
APPARATUS FOR CONDITIONING WATER SUPPLIED TO A WATER HEATER TANK
Samuel J. Moore, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,770
Int. Cl. C23f *14/00*
U.S. Cl. 210—181 **5 Claims**



The water supply main is connected to the inlet of a first closed tank containing water-conditioning material. The outlet of the first tank is connected to the inlet of a second closed tank, the outlet of which is connected to the inlet of the heater tank. The second tank is dimensioned to contain a volume of water exceeding the expansion in volume of the initially cold water in the heater

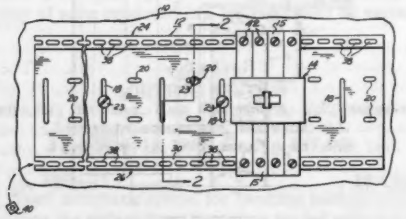
tank when it is raised to a predetermined temperature. The inlet and outlet of the second tank are located or arranged as not to disrupt the stratification of the water in the second tank upon the backflow from the heater tank whereby high temperature backflow from the heater tank does not enter the first tank containing the conditioning material.

3,606,018
FOLDING INDOOR CLOTHES DRYER
Irving Ruina, North Miami, Fla., assignor to Russell Aluminum Corporation, Miami, Fla.
Filed Aug. 18, 1969, Ser. No. 850,729
Int. Cl. A47g *25/06*; A47k *10/04*
U.S. Cl. 211—1.3 **3 Claims**



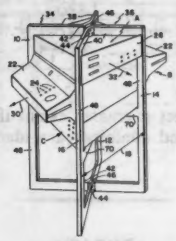
A collapsible indoor clothes dryer includes an elongated box-like enclosure with open front. Channel members each equal in length to one-half the enclosure are hinged to ends of the enclosure. A collapsible frame formed by mutually pivotable side bars and horizontal rods is secured at one end inside the enclosure. Lugs on ends of the side bars hold them in V-shaped angular disposition when the frame is extended, so that adjacent rods are disposed in different planes.

3,606,019
MOUNTING PAN FOR ELECTRICAL PANEL BOARD
Robert J. Dubiel, 22140 Guidot, Taylor, Mich. 48180
Filed Feb. 6, 1969, Ser. No. 797,041
Int. Cl. A47f *7/00*
U.S. Cl. 211—26 **16 Claims**



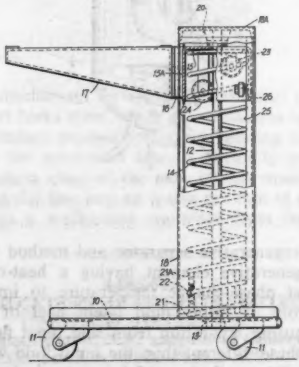
A mounting pan for electrical components, such as relays or the like, for mounting on a panel board or cabinet wall panel, having appropriate apertures for mounting on the panel board or wall panel and a pair of parallel side channels provided with apertures for mounting of the components on the pan, and retaining means dependent from the channels for holding captive mounting nuts and the like. A modification of the pan is constructed to be adjustable in width for adaptability to be adjustable to various sizes of components.

3,606,020
RACK FOR ELECTRONIC MODULES
Walter Kern, Cohasset, Mass., assignor to Teradyne, Inc., Boston, Mass.
Filed Sept. 18, 1969, Ser. No. 859,096
Int. Cl. A47f *7/00*; H02b *1/04*
U.S. Cl. 211—26 **14 Claims**



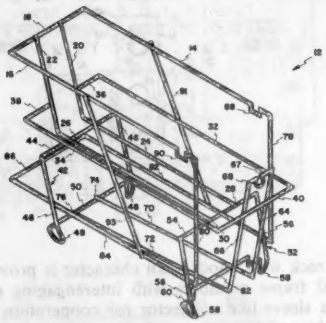
A rack for supporting a plurality of electronic component modules in an array provides maximum accessibility to the side panels of each module. The rack includes a skeletal frame having vertical, parallel bars arranged to embrace, and be secured to, the corners of each module which is supported by the rack. The lateral span between adjacent bars is unobstructed so that each side panel of each module is exposed fully. The vertical bars are rigid and are secured to each other by means of upper and lower bracing elements which connect together the upper ends of the bars and the lower ends of the bars and do not interfere with the supported modules. When the modules are mounted in the rack, panels span adjacent vertical bars so that the side panels cooperate with the cross braces to define a rigid triangular structure.

3,606,021
MATERIALS HANDLING APPARATUS
Hans Roels, Dordrecht, Netherlands, assignor to American Machine & Foundry Company
Filed June 10, 1969, Ser. No. 831,909
Int. Cl. A47f *1/00*; B66f *9/00*
U.S. Cl. 211—49R **2 Claims**



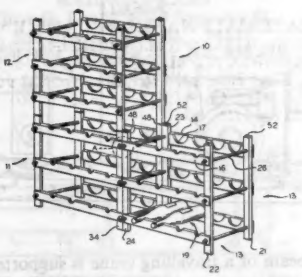
This invention is for materials handling apparatus wherein an article supporting tray is adapted to move upwardly and downwardly with respect to the base in response to weight of the article on the tray on a calibrated compression spring. The tray is prevented from tilting or rotating in one or more directions by the provision of a guiding member, guiding channel and guiding means.

3,606,022
STORAGE AND DISPENSING RACK
William N. Beesley, 2755 Apple Blossom, Salt Lake City, Utah 84117
Filed May 14, 1970, Ser. No. 37,080
Int. Cl. A47f *7/00*
U.S. Cl. 211—49 9 Claims



A two-tier storage and dispensing rack of wire construction including upper and lower ramps connected by a chute. Downwardly depending feet are inwardly contoured to function as coupling members so that two-tier racks may be releasably stacked one on top of another to form a continuous multi-tier dispensing unit for receiving and dispensing cylindrical containers, such as standard-size food cans.

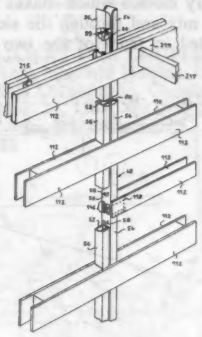
3,606,023
WINE RACK
Frank A. Edmunds, 7920 S. Greenwood Ave., Chicago, Ill. 60619
Filed Dec. 29, 1969, Ser. No. 888,610
Int. Cl. A47b *73/00*
U.S. Cl. 211—74 10 Claims



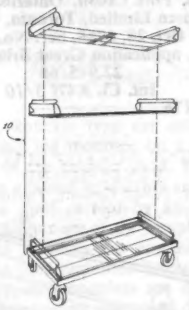
A sectional knock down rack that can be assembled without any tools. The individual sections are amenable to vertical stacking and to horizontal joining.

3,606,024
MULTIPURPOSE STRUCTURE IN STANDARDIZED ELEMENTS
André Mieville, Lausanne, Switzerland, assignor to SA pour l'Etude de la Promotion des Entreprises, Fribourg, Switzerland
Filed June 2, 1969, Ser. No. 829,343
Claims priority, application Switzerland, May 31, 1968, 8,146/68
Int. Cl. A47f *5/10*
U.S. Cl. 211—176 23 Claims

A structure in standardized elements, for example forming a piece of furniture, comprises a framework of parallel longitudinal sectioned elements assembled by means of transverse elements. Each longitudinal element comprises at least two hollow open sections which interfit by elastic gripping in a manner to define a generally prismatic longitudinally enclosed enclosure and the transverse elements are fitted to the longitudinal elements by the gripping of the two interfitting sections. The sections of the longitudinal element can be of U-shaped cross section and have an exterior surface of plastics material to increase the gripping effect thereof.



3,606,025
MODULAR RACK
James D. Wilson, Long Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.
Filed Aug. 27, 1969, Ser. No. 853,379
Int. Cl. A47f *3/14*; B65d *21/02*
U.S. Cl. 211—126 2 Claims

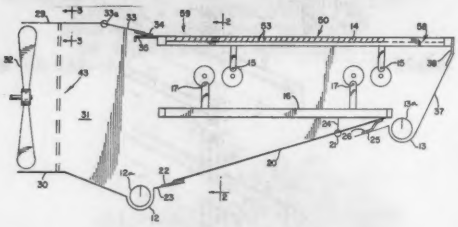


A demountable rack formed of separate wire-formed shelf modules capable of being stacked over one another in a spaced and parallel relationship is provided. The demountable rack of the invention has particular utility for the cooling, storage and movement of pies, pastry shells, and the like, and it has general utility in the bakery and other industries. The rack of the invention is intended primarily to replace the prior art type of racks which include solid corner posts and shelves supported thereby.

3,606,026
SIEVE MECHANISM FOR SEPARATING GRAIN
Bernard C. Mathews, Box 70, Crystal Lake, Ill. 60014
Filed Apr. 22, 1969, Ser. No. 818,295
Int. Cl. B07b *1/28*
U.S. Cl. 209—318 7 Claims

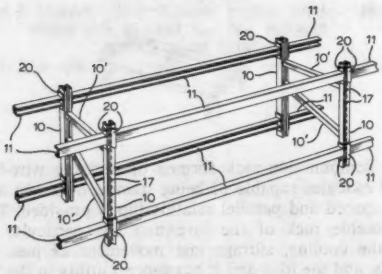
The separating mechanism comprises an upper sieve and a lower sieve located one above the other and sup-

ported by cranks journaled in the side walls of the casing of a combine. The cranks for the upper and lower sieves are offset from each other 180°. The cranks are driven at about 200 r.p.m. Both of the sieves have transverse ribs about ½ inch high and 2 inches apart. Threshing mix deposited on the upper sieve will be agitated by the circular vibratory motion which shakes the grains or kernels out of the mix and through the sieves. An axial delivery fan located in front of the two sieves causes an



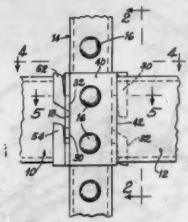
air blast to blow upwardly through the upper sieve. Flexible seals are provided at the front and rear ends of the upper sieve to confine the air blast. A shutter in the form of sliding plates regulates the air blast. The casing has a movable bottom which is hingedly mounted at its rear end at the lower sieve and slidingly engages a portion of the casing at its front end. Preferably, the openings in the upper sieve are in the form of transverse slots having shelves underneath and slots to block endwise movement of straw.

3,606,027
ADJUSTABLE STORAGE RACK
Denis Clements, Port Credit, Ontario, Canada, assignor to Westeel-Rosco Limited, Toronto, Ontario, Canada
Filed Oct. 28, 1968, Ser. No. 771,198
Claims priority, application Great Britain, May 14, 1968, 22,945/68
Int. Cl. A47f 5/10
U.S. Cl. 211—176 **7 Claims**



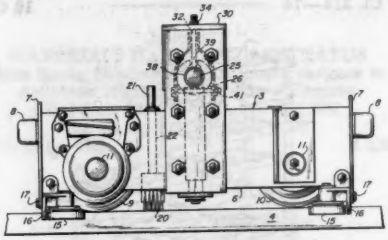
An adjustable storage rack wherein horizontal support rails adjustably interconnect hollow, vertical columns, each column being substantially M-shaped in cross-section. Brackets secured to the ends of the support rails each present teeth which engage a vertical row of apertures centrally formed in the front wall of the column with the bracket embracing a side wall of the column and the portion of the front wall between this side wall and the row of apertures, this portion of the front wall being at an acute angle to the adjacent side wall.

3,606,028
INTERCONNECTING MEMBERS FOR EXTERIOR CONNECTION TO RACK COLUMN
Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.
Filed June 4, 1970, Ser. No. 43,344
Int. Cl. A47f 5/10
U.S. Cl. 211—177 **6 Claims**



A rack with knockdown character is provided by horizontal frame members with interengaging ends that define a sleeve-like connector for cooperation with vertical uprights, wherein the vertical upright is imperforate with one side shaped to provide a vertical series of uniformly-spaced protuberances that are adapted to enter apertures defined on the sleeve-like connector to provide a supporting interconnection.

3,606,029
HOISTING APPARATUS
Auguste Verlinde, 19 Rue Danton, 59 Loos-lez-Lille, France
Continuation-in-part of abandoned application Ser. No. 624,812, Mar. 21, 1967. This application June 16, 1969, Ser. No. 833,428
Claims priority, application France, May 12, 1966, 61,321
Int. Cl. B66c 17/00
U.S. Cl. 212—18 **9 Claims**

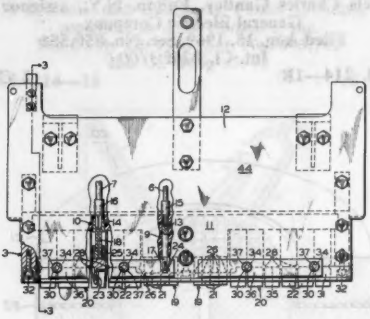


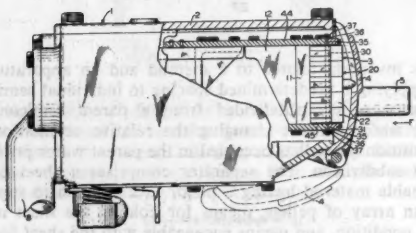
The beam of a travelling crane is supported at opposite ends by carriages running on parallel rails. The support at at least one end comprises a bearing member which is supported on the carriage to rotate about a horizontal axis and has a horizontal bearing cavity rotatively and slidably receiving a horizontal shaft projecting horizontally from the respective end of the beam.

3,606,030
AUTOMATIC ELECTRIC LINE COUPLER WITH REMOVABLE CONTACT UNIT
Richard K. Frill, Pittsburgh, and Ronald F. Monzi, Lower Burrell, Pa., assignors to Westinghoue Air Brake Company, Wilmerding, Pa.
Filed Mar. 13, 1970, Ser. No. 19,384
Int. Cl. B61g 5/10; B60d 7/00
U.S. Cl. 213—1.3 **10 Claims**

An automatic multiple electric conductor connecting portion for an automatic railway car coupler having counterpart multiple-contact units in each mating head of

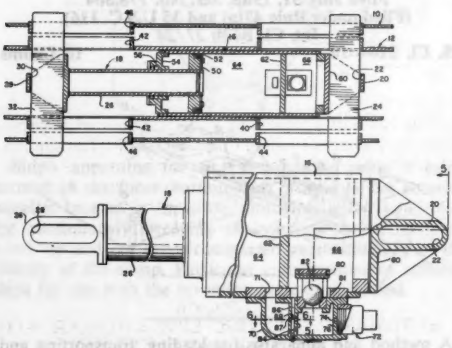
the coupler and in which said multiple-contact units are accessibly arranged so as to be removable and replace-





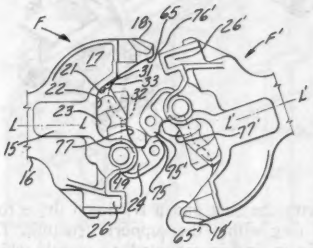
able without removal of the electric conductor connecting portion from the coupler mating head.

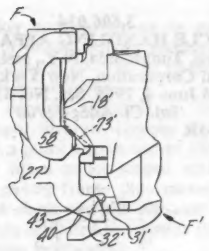
3,606,031
SHOCK ABSORBING MECHANISM FOR RAILWAY CARS
Einar O. Lunde, 1045 Sansome St., San Francisco, Calif. 94111
Filed Sept. 16, 1969, Ser. No. 858,418
Int. Cl. B61g *9/12, 9/16*
U.S. Cl. 213—8 **7 Claims**



A railway car includes a frame structure slidably supporting a center sill carrying coupler means. Shock absorbing mechanism includes a cylinder and a piston slidable therein. A pair of keys are connected with the cylinder and piston, the keys each having a lost motion connection with the center sill and the frame structure. The cylinder is divided into a large chamber and a small chamber interconnected by a passage having a check valve therein. A second passage provides communication between the large and small chambers and has an adjustable metering means therein. The chambers are filled with air by means of a differential air inlet valve which is continuously connected with a source of air pressure.

3,606,032
RAILWAY CAR COUPLER
Kenneth L. De Penti, Mayfield Heights, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Mar. 23, 1970, Ser. No. 21,831
Int. Cl. B61g *3/04*
U.S. Cl. 213—152 **7 Claims**



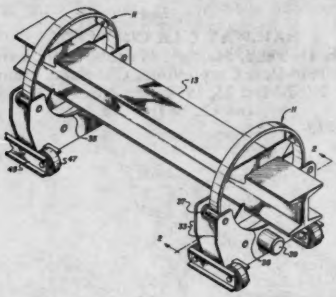


An interlocking knuckle type car coupler having an auxiliary interlocking lug mounted on a shelf carried on the lower portion of the coupler head. The auxiliary lug has a ramp portion adapted to slidably engage the bottom forward edge of a shelf carried by an opposed mating coupler to permit alignment of the couplers for coupling when two opposed couplers are angularly and/or vertically misaligned a predetermined amount and when the knuckles of the opposed couplers are each in an open position during the coupling operation. The interlocking coupler has an aligning wing pocket at the knuckle side of the coupler carrying vertically spaced upper and lower interlocking lugs adapted to cooperate with an aligning nose on the guard arm of a similar coupler. The lower interlocking lug and guard arm aligning nose are modified to improve the horizontal and vertical gathering characteristics between their cooperating surfaces during the coupling operation of two opposed couplers when the couplers are vertically and angularly misaligned.

3,606,033
STRUCTURE HANDLING DEVICE
Pat Barilla, 6101 Ivory Circle, Huntington Beach, Calif. 92647
Filed Mar. 24, 1969, Ser. No. 809,803
Int. Cl. B65g *7/00*
U.S. Cl. 214—1Q **2 Claims**

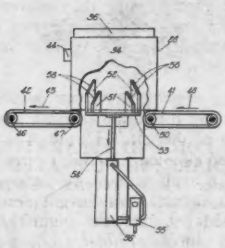
A device for handling structures particularly including steel wide flange beams and the like comprising a ring

of diameter substantially larger than the piece to be held with a pair of holding plates detachably connected to the ring and extending inwardly and having a configuration conforming to the piece to be held. Half of the ring rests on a support structure having a plurality of idler rollers



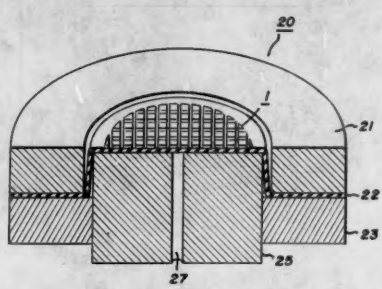
in contact with the ring and a frictional drive roller for rotating the ring within the support structure. The support structure is further mounted on wheels which contact the ground so that it can readily be maneuvered when the structure being handled is supported.

3,606,034
ARTICLE HANDLING APPARATUS
Paul G. Lewis, Tonawanda, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed June 4, 1969, Ser. No. 830,277
Int. Cl. A45c *11/00*
U.S. Cl. 214—1R **5 Claims**



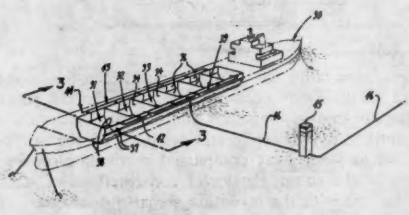
A unique article carrying container and associated apparatus utilized therewith in a manual or automatic retrieval and storage system. The container is adapted to accommodate a plurality of substantially flat articles; such as documents, file folders, or the like. Appropriate means deliver a container to an operator console, whereupon the documents are automatically lifted from the container for convenient access. The upper edges of the articles are exposed in an echelon array to facilitate identification by means of associated indicia or coding means applied thereto. The lifting arrangement at the console comprises one or more fingers adapted for registration with a like number of cooperating slots in the container to effect engagement with the bottom edges of the articles accommodated by the retrieved container. Article guide means on the interior surface of the container prevent articles from becoming lodged between the fingers and the container walls under conditions where the fingers are protruding through the slots.

3,606,035
SUBDIVIDED SEMICONDUCTOR WAFER SEPARATOR
Francis Charles Gantley, Fulton, N.Y., assignor to General Electric Company
Filed Aug. 15, 1969, Ser. No. 850,551
Int. Cl. B26f *3/00*
U.S. Cl. 214—1R **2 Claims**



This invention related to a method and an apparatus for supplying a predetermined spacing to individual semiconductor pellets, subdivided from a parent semiconductor wafer without changing the relative orientation and position the pellets occupied in the parent wafer prior to the subdivision. The separator comprises a sheet of stretchable material having a major face adapted to support an array of pellets, means for holding the sheet in a taut condition, and means engageable with the sheet for simultaneously stretching the same in two mutually perpendicular coordinates in the plane of the major face. Thus, when the stretching of the sheet is increased, the spacing between the pellets supported on the sheet also increases and thereby facilitates treatment of each individual pellet with minimized disturbance of its neighbor.

3,606,036
METHOD AND APPARATUS FOR SHIPPING MINERAL SOLIDS AND OTHER PARTICULATE MATTER
Robert R. Beebe, Tiburon, and Emmett J. Murphy, Woodside, Calif., assignors to Marcona Corporation, San Francisco, Calif.
Filed July 31, 1968, Ser. No. 778,364
(Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. B63b *27/24*
U.S. Cl. 214—14 **10 Claims**



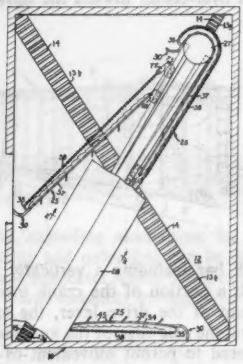
A method and apparatus for loading, transporting and discharging discrete minerals in ships in which a slurry of the mineral is pumped into and allowed to settle in the hold of the ship and excess water decanted off to leave a settled material in the form of a nonshifting cargo. At the destination the settled material is pulped to form a pumpable slurry by application of water and vigorous agitation. The slurry so formed is then pumped out of the ship through suitable piping.

3,606,037

CENTRAL DRAG LINE SYSTEM FOR NON-CYLINDRICAL PARTICLE STORAGE FACILITIES

John L. Peterson and George H. Pettis, Spokane, Wash., assignors to Atlas Spokane, Inc.

Filed July 22, 1969, Ser. No. 843,702
Int. Cl. B65g 65/42
U.S. Cl. 214—10 8 Claims



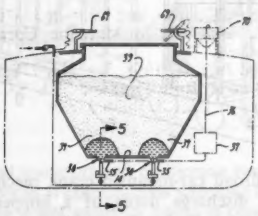
A plurality of drag lines are attached to a continuous chain mounted above a flat floor over a floor aperture in the center of a non-cylindrical particle storage facility for digging granular material from a base of a pile and conveying the material to the floor aperture.

3,606,038

ORE CARRIER WITH SLURRY REPULPING AND UNLOADING SYSTEM

Tom B. Thomas, Walnut Creek, Robert R. Beebe, Tiburon, and Norman J. Thompson, Moraga, Calif., assignors to Marcona Corporation, San Francisco, Calif.

Continuation of abandoned application Ser. No. 796,730, Feb. 5, 1969. This application Aug. 17, 1970, Ser. No. 64,579
Int. Cl. B63b 27/00
U.S. Cl. 214—15B 3 Claims



Ship's apparatus for slurry repulping using a sump formed in the inner bottom with a mechanical rotating impeller located in the sump and carrying hydraulic jets for continuously sweeping the vicinity of the sump to break up and cut away compacted particulate ore in the vicinity of the sump. Particular constructions of suitable ships for use with the invention are also disclosed.

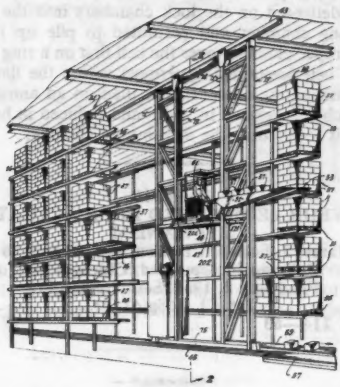
3,606,039

STACKER CRANE SYSTEM

David C. Weston, Los Angeles, and Adrian A. Arnott, West Covina, Calif., assignors to Interstate Restaurant Supply Co., Los Angeles, Calif.

Filed May 12, 1969, Ser. No. 823,762
Int. Cl. B65g 65/02
U.S. Cl. 214—16.4A 12 Claims

A stacker crane and conveyor system for retrieving articles from a vertical stack and depositing them at a collection point. The system includes a horizontal storage conveyor extending longitudinally of the stack and leading to a collecting point. A gantry frame is carried on a track extending longitudinally of the storage conveyor and mounts an elevator having an operator's platform thereon. Thus, the gantry frame may be moved to a position along the track and the elevator raised to a selected level so the operator can select articles from the stack and lower the elevator to deposit the articles so selected on the storage conveyor for eventual conveyance to said collecting point.



Ramp-type picker conveyors may be mounted on the elevator for receipt of the articles picked and for actuation when the elevator is lowered to transfer the selected articles to the storage conveyors.

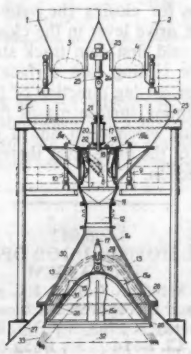
A lifting fork may be mounted on the elevator for transverse movement thereon whereby the gantry frame may be moved to a point at one end of the stack and the fork activated to lift a pallet loaded with articles onto the elevator, the gantry frame then moved to a selected position along the stack and the elevator raised and, finally, the fork again activated to transfer the loaded pallet to a selected position in the stack.

3,606,040

METHOD OF AND APPARATUS FOR CHARGING FURNACES

Manfred Euteneuer, Essen-Bredeney, Germany, assignor to Demag A.G., Duisburg, Germany

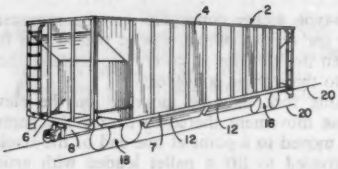
Filed May 9, 1969, Ser. No. 823,427
Int. Cl. F27b 11/12
U.S. Cl. 214—37 10 Claims



An apparatus for charging shaft furnaces particularly blast furnaces which are operated at high pressure in-

cludes a plurality of lock chambers which are arranged with their inlet ends connected through lock chamber openings to one or more storage bins and with their discharge ends located for selective discharge into a central distributing chamber. The distributing chamber has a flared lower end which opens into the furnace and which accommodates a distributor bell. The flared end of the distributor is dimensioned so that the distributor bell may be shifted upwardly and downwardly therein for varying the cross sectional area of the material delivered to the top of the bell of distribution downwardly into the furnace. In accordance with the inventive method, the material is delivered on the lock chambers into the central distributing chamber and permitted to pile up in front of the furnace chamber over the bell first on a ring surface with the bell positioned uppermost within the flared end of the distributing chamber and then on an annular surface which is increased in width and reduced in height as the bell is lowered in the distributing chamber.

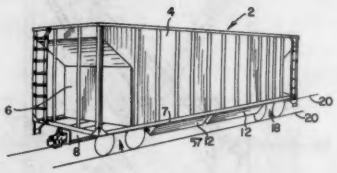
3,606,041
OFF-VEHICLE-MOUNTED DOOR ACTUATING MECHANISM
James J. Schuller, Dolton, Ill., assignor to Pullman Incorporated, Chicago, Ill.
Filed July 2, 1969, Ser. No. 838,572
Int. Cl. B65g *67/24*
U.S. Cl. 214—63 **17 Claims**



Trackway-mounted railroad hopper car door actuating mechanism including a pair of longitudinally spaced cam track structures, said first cam track structure in the door opening direction of the door operating mechanism presenting transversely extending drive lever engaging door opening cam surfaces, said second cam track structure in the door opening direction of the door operating mechanism presenting a final opening transverse cam surface for final opening of the hopper doors and a pivotal cam track gate for passage of the drive lever therethrough in the opening moving direction of the railroad car, said second cam track structure in the door closing direction of the hopper car door operating mechanism presenting an initial cam surface for closing the vehicle doors and engageable with the drive lever in the closing moving direction of the car, said first cam track structure having an intermediate door closing cam surface and pivotal cam means in the door closing direction of the door operating mechanism presenting surface means for final closing of the door operating mechanism and a pivotal cam track gate for passage of the drive lever therethrough in the car door closing direction.

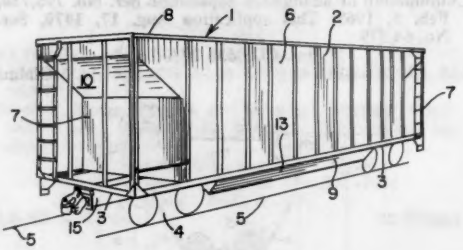
3,606,042
VEHICLE HOPPER DOOR OPERATING MECHANISM
James J. Schuller, Dolton, Ill., assignor to Pullman Incorporated, Chicago, Ill.
Filed July 2, 1969, Ser. No. 838,714
Int. Cl. B61d *7/30*; B65g *67/24*
U.S. Cl. 214—63 **8 Claims**

In a railroad hopper car, a hopper door operating mechanism including a car-mounted door opening and closing crank mechanism and a track-engaging drive lever constrained for rotation with said crank mechanism and having hopper door opened and closed positions, the crank mechanism in the closed position having its linkage disposed in over-center relation to prevent accidental opening of the car doors and an auxiliary lock bar preventing movement of the drive lever to the open position should it pass over-center toward the open position, said



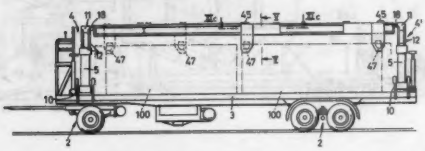
auxiliary lock bar including a vertically pivotal bar engageable with a portion of the crank mechanism to prevent movement of the drive lever, the end edge of the drive lever and the side edge of the auxiliary lock bar each being chamfered to permit movement of the drive lever from the open to closed position by raising of the lock bar to permit passage of the drive lever past the lock.

3,606,043
LOCK MEANS FOR DOOR OPERATING MECHANISM
Roy W. Miller, Highland, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed July 2, 1969, Ser. No. 838,715
Int. Cl. B61d *7/30*; B65g *67/24*
U.S. Cl. 214—63 **17 Claims**



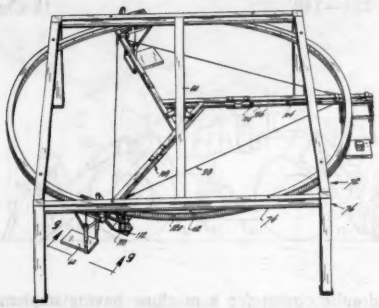
For a railroad car-mounted crank mechanism for operating the discharge doors of a hopper railroad car between open and closed positions, an auxiliary lock device for limiting movement of the crank mechanism from the closed door position, the lock device being pivotally mounted at one end thereof to one end of a car-mounted fixed support, a multiplier unit pivotally mounted intermediate its ends to the other end of the support and one end of the unit being a free end carrying roller means below the point of pivotal mounting of the unit, the upper part of one end of the unit being a free end and slidingly supporting the lock device, the other end being a free end having abutment with a car-mounted stop to limit pivoting of the multiplier unit, the underside side portion of the multiplier unit carrying roller means between and below the multiplier unit pivot and the one end of the multiplier unit, said roller means being adapted for engagement with the rail means for raising the lock device out of the path of movement of the crank mechanism attendant to rotating the crank mechanism to the open door position.

3,606,044
LOADING AND UNLOADING APPARATUS FOR BULKY LOADS
Alois Goldhofer, 397 Donaustrasse, D–8941 Amendingen, Memmingen, Germany
Filed Apr. 14, 1969, Ser. No. 815,843
Claims priority, application Germany, Apr. 13, 1968, P 17 55 215.7; Apr. 27, 1968, P 17 55 332.1
Int. Cl. B60p *1/48*; B66c *23/62*
U.S. Cl. 214—77R 11 Claims



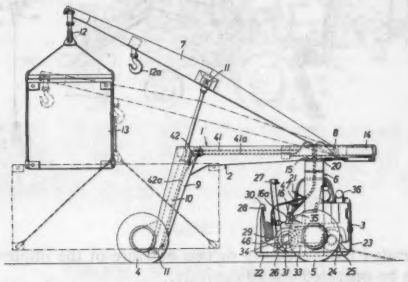
A loading and unloading mechanism for bulky loads wherein the loading and unloading can be carried out at either side of the transporter, there being extendable support tubes for a frame assembly having a plurality of load holding implements.

3,606,045
INSTRUMENT TRANSPORT AND POSITIONING SYSTEM
John C. Abromavage, Tempe, and James F. George, Phoenix, Ariz., assignors to Advanced Management Engineering & Research Co., Phoenix, Ariz.
Filed Nov. 19, 1969, Ser. No. 878,079
Int. Cl. B65g *21/22*
U.S. Cl. 214—89 10 Claims



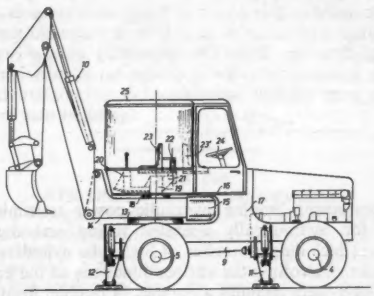
An instrument transport and positioning system for use in multiphasic medical examinations screening laboratories of a type where a test sequence phase is conducted in a plurality of juxtaposed wedge shaped test chambers surrounding a central core area wherein each test chamber is adapted to encompass therein for a given test all instruments required to perform predetermined tests in a prephased sequence with inexpensive instruments located in each test chamber, expensive equipment being centrally located in the central core and inter-connected with each test chamber via a cable, with still further expensive equipment mounted on a circular track above the wedge shaped test chamber adapted for selective vertical placement in or removal from each chamber. The equipment mounted on the track is adapted for movement along the track and lowering or raising through a ceiling door in the chambers with the ceiling door and raising and lowering mechanism for the equipment being phased in the test time sequence and automatically operable by means of coacting devices selectively operated upon given increments of movement of the equipment around said track.

3,606,046
CONTAINER HANDLING VEHICLE
Karl-Heinz Griesenbrock, Duisburg, Germany, assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio
Filed Mar. 2, 1970, Ser. No. 15,665
Int. Cl. B66c *23/00*
U.S. Cl. 214—130R 5 Claims



A materials handling device includes a wheeled frame, a lifting boom, and frame supported platform upon which a self-propelled vehicle can be driven for supplying power for propulsion, lifting and braking of the mobile frame.

3,606,047
VEHICLE WITH SWINGING TOOL OPERATOR
Hans Schaeff, Langenburg, Germany, assignor to Karl Schaeff KG, Maschinenfabrik, Langenburg, Wurttemberg, Germany
Filed June 20, 1969, Ser. No. 834,960
Claims priority, application Germany, June 20, 1968, P 17 59 910.9
Int. Cl. E02f *3/28*
U.S. Cl. 214—138 9 Claims

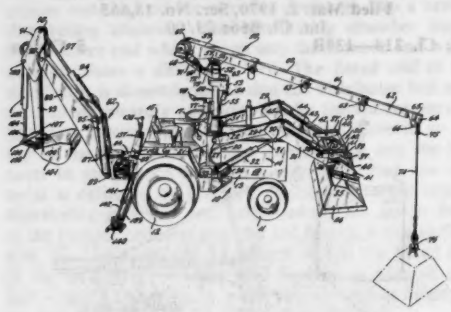


A vehicle having an excavator on the rear end wherein the operator's compartment has a seat which is rotatable so that the operator can move his location from vehicle driving position to an excavator operating position.

3,606,048
VEHICLE HAVING FRONT, CENTRAL AND REAR IMPLEMENTS
William R. Long, Tarboro, N.C., assignor to Long Manufacturing Company, Tarboro, N.C.
Filed Sept. 5, 1969, Ser. No. 855,646
Int. Cl. B66f *9/00*
U.S. Cl. 214—138 6 Claims

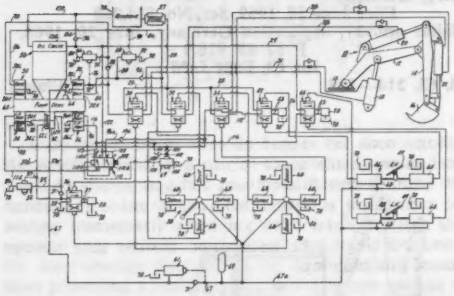
A land vehicle having implements mounted at the front, central and rear portions and in which certain of said

implements are replaceable by other implements and such implements are arranged so that each implement can be



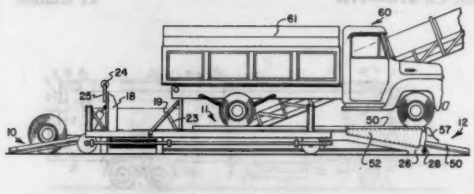
operated independently or two or more of the implements can be operated simultaneously.

3,606,049
HORSEPOWER LIMITING HYDRAULIC CONTROL CIRCUIT
Richard O. Gordon, Belgium, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.
Filed Nov. 12, 1969, Ser. No. 875,797
Int. Cl. E02f *3/30*
U.S. Cl. 214—138 **8 Claims**



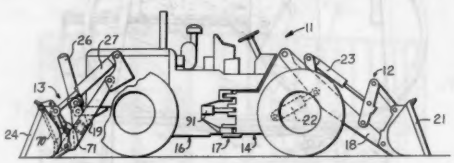
A horsepower limiting hydraulic power transmission system for hydraulically operated lifting and digging equipment including a number of hydraulic cylinders and motors for controlling the various functions of the equipment. The system includes a number of double, fixed volume pump assemblies operatively connected to the main engine, each pump assembly including a high volume-low pressure pump and a low volume-high pressure pump, one high volume pump from each assembly being cross connected to one of the low volume pumps of another pump assembly to provide hydraulic fluid for one of the cylinders or motors; a pilot operated valve connected across each pair of cross connected pumps, each of the valves is responsive to the pressure of the low volume-high pressure pump to bypass the fluid from the high volume-low pressure pump to the reservoir. A double acting hydraulically actuated valve is included and is responsive to the pressure of either of two low volume pumps to simultaneously by-pass both corresponding high volume pumps and thereby simultaneously shift two operating functions from high horsepower to low horsepower operation.

3,606,050
ELEVATING DUMP RAMP
Joseph M. Silver, 185 23rd St., Ogden, Utah 84401
Filed June 23, 1969, Ser. No. 835,453
Int. Cl. B65g *67/24*
U.S. Cl. 214—46 **10 Claims**



An elevating ramp for use with beet pilers. The ramp is arranged to have a level dump section, an upwardly inclined approach-section and a downwardly inclined exit section. The exit section includes a portion arranged to be raised such that it forms a level or upwardly extending continuation of the level section and the level section includes pivotable hopper plates through which trucks positioned on the level section and the raised down section can dump their loads.

3,606,051
HYDRAULIC IMPLEMENT CONTROL CIRCUIT
Wayne A. Peterson, R.R. 3, Kurt and Kent Roads 60435, and Edward A. Wirtz, R.R. 3, McClintock Road 60436, both of Joliet, Ill.
Filed Jan. 26, 1970, Ser. No. 5,577
Int. Cl. B66f *9/00*
U.S. Cl. 214—140 **12 Claims**

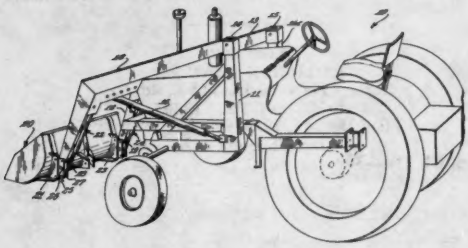


A hydraulic circuit for a machine having implements arranged on two portions of the machine, a fluid tank and implement control valve assembly associated with each implement, a pump for drawing fluid from one of the tanks and delivering it to the control valve assemblies with conduits for returning exhaust fluid to either of the tanks, a fluid equalizing line and an air equalizing line interconnecting the two tanks to assure an adequate supply of hydraulic fluid in each tank.

3,606,052
LOADER ATTACHMENT QUICK COUPLER DEVICE
James L. Schurz, Sioux Falls, S. Dak., assignor to Du-Al Manufacturing Company, Sioux Falls, S. Dak.
Filed July 3, 1969, Ser. No. 838,841
Int. Cl. E02f *3/70*
U.S. Cl. 214—145 **1 Claim**

A quick-connect-disconnect coupler for attaching loading implements to the forward end of a lifting and dumping type boom assembly. Coupling is accomplished by manipulation of the hydraulic rams of the loader and includes automatic latching of the implement and boom

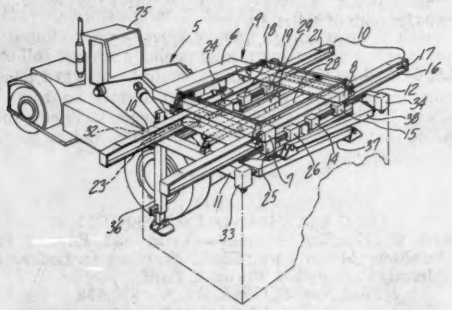
assembly. The latch mechanism may be locked by insertion of a locking pin. Upon release of the latching mechanism, the implement may be uncoupled by reverse operation of the hydraulic rams.



3,606,053
GRAPPLER-SPREADER FOR CANTILEVER-BOOM TRUCKS

Donald R. Whiteman, Roxboro, N.C., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 15, 1969, Ser. No. 884,986
Int. Cl. B66c 1/30
U.S. Cl. 214—147G 7 Claims



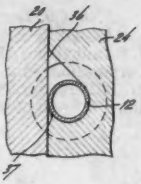
An expandable spreader and grappling device, termed herein a grappler-spreader, for top-lifting cargo containers and bottom-lifting containers, piggyback trailers, etc. particularly adapted for use on large front or side lift trucks or other vehicles which provide a cantilever-type lifting boom. For bottom-lifting, the device necessarily has grappling arms which are retractable in order that the top-lifting mechanism may be used more effectively. In the present instance, the arms, which are on the side of the spreader toward the supporting vehicle, are shortenable to a length within the height of a container.

3,606,054
METHOD FOR STABILIZING A PLURALITY OF ABUTTING RECTILINEAR SURFACES

James A. Miller, Rte. 1, Box 225, Tiffin, Ohio

Filed Apr. 15, 1969, Ser. No. 816,205
Int. Cl. B65g 1/14
U.S. Cl. 214—152 2 Claims

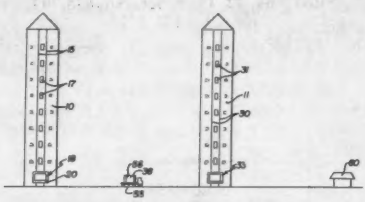
Method for stabilizing a plurality of abutting rectilinear surfaces, so as to hold the surfaces in longitudinal and lateral alignment in a desired support plane, particularly a method for so stabilizing a plurality of squared spool ends. The method includes notching opposed portions of the abutting surfaces so as to define a cylindrical aperture, then securing the surface against lateral movement by imposing a cylindrical force within the aperture and securing the surfaces against longitudinal movement by applying opposed lateral forces radially outwardly of said aperture on both sides of said abutting surfaces.



3,606,055
GOODS MOVING METHOD

Berge M. Heede, Jr., Greenwich, Conn., and James K. McGuigan, North Vancouver, British Columbia, Canada, assignors to Sky-Van Limited, Vancouver, British Columbia, Canada

Filed May 23, 1969, Ser. No. 827,384
Int. Cl. B65g 63/06
U.S. Cl. 214—152 13 Claims

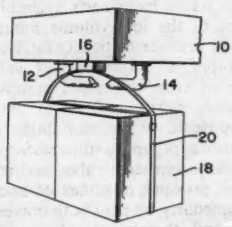


There are disclosed a method of and apparatus for moving goods between multi-storied buildings. A container in which the goods are loaded is latched to a lift unit mounted on a first building to be transported by said unit to a vehicle, is transported by said vehicle to a second building, and is latched to a lift unit mounted on the second building to be transported thereby to a desired floor of said building.

3,606,056
STRAPLIFT LOADING SYSTEM

Howard Morgan, Vancouver, British Columbia, Canada, assignor to Skagit Corporation, Sedro Woolley, Wash.

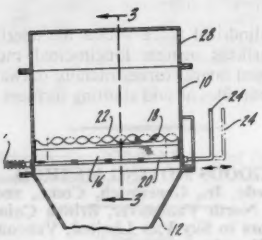
Original application Jan. 25, 1968, Ser. No. 706,739, now Patent No. 3,493,259, dated Feb. 3, 1970. Divided and this application Aug. 20, 1969, Ser. No. 851,571
Int. Cl. B66c 1/18
U.S. Cl. 214—152 5 Claims



A strapped load can be lifted by positioning a strap-lift device over the load and horizontally slewing load-

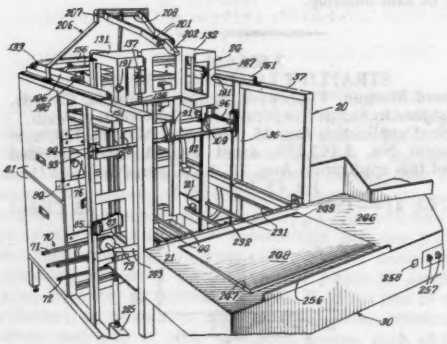
lifting arms of the straplift device through the top load-lifting strap arc of the strapped load from the high point of the arc and suspendingly lifting the load by the strap.

3,606,057
BAG OPENER
Robert June II, Birmingham, Mich., assignor to Triskelion Corporation, Franklin Park, Ill.
Filed Apr. 2, 1970, Ser. No. 25,196
Int. Cl. B65b *69/00*
U.S. Cl. 214—305 **8 Claims**



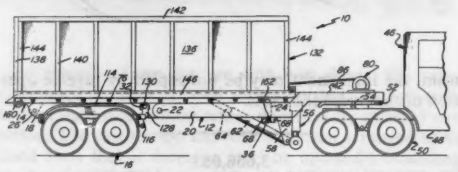
A bag receiving hopper having two hinged blades therein. The blades having undulating cutting edges and being arranged for side-by-side contact during cutting. One of said blades being longitudinally displaceable with respect to the other and said blades being pivoted away from each other during the bag emptying operation. A cover is provided for said hopper to retain dust within said hopper and said hopper communicates with a product receiving hopper located therebelow. Said product receiving hopper has conveyor means communicating therewith.

3,606,058
CASE CUTTING MACHINE
Allan C. Davis, Baltimore, Md., assignor to The Meyercord Co., Wheaton, Ill.
Filed Dec. 18, 1968, Ser. No. 784,776
Int. Cl. B65b *69/00*
U.S. Cl. 214—305 **22 Claims**



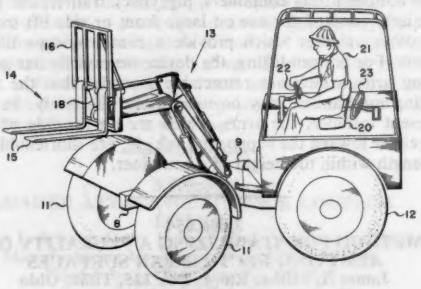
This disclosure deals with a machine for automatically cutting a case into two parts and breaking the two parts apart to make the contents of the case accessible. The machine moves a case in a first direction between a pair of spaced cutting blades which slit two sides of the case. The case is then moved in a second direction between a second pair of cutting blades which slit another two sides of the case, the second direction being at an angle to the first direction. The four blades are located in a single plane, thus dividing the case into two parts. The portion of the machine which moves the case in the second direction is also operable to break the two parts of the case apart after the case has been moved past the second pair of blades.

3,606,059
ROLL-OFF TRAILER
Herbert Haberle, Jr., 113 E. 4th St., Bridgeport, Pa. 19405
Filed Dec. 15, 1969, Ser. No. 885,167
Int. Cl. B60p *1/28*
U.S. Cl. 214—505 **20 Claims**



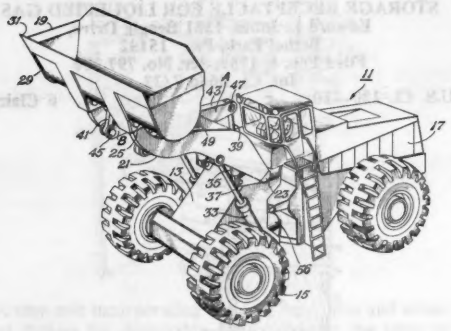
A roll-off trailer comprising a support frame and a main frame pivotally mounted thereon at the rear thereof. The rear wheels of the trailer are slidable relative to the support frame whereby they may be moved from the rear of the support frame to an intermediate point on the support frame. The support frame comprises two pivotally linked sections which are linked at the intermediate point to which the rear wheels may be moved. By pivoting the support frame at the intermediate point, a smaller roll-off angle is attained than that which would be obtained when using the prior art unsplit support frames on roll-off trailers. Having the smaller roll-off angle facilitates the loading and unloading of container bodies and cargo on the main frame.

3,606,060
MATERIAL HANDLING VEHICLE
David R. Fleming, Mountain View, and Edward H. Jacobsen, Menlo Park, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Nov. 28, 1969, Ser. No. 880,638
Int. Cl. B66f *9/00*
U.S. Cl. 214—771 **3 Claims**



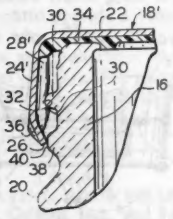
A material handling vehicle adapted for rough terrain operations having pantographic linkage means for lifting a load from the terrain and for positioning the load over the vehicle chassis for transport.

3,606,061
FRONT END LOADER TYPE VEHICLE
Lloyd A. Molby, Longview, Tex., assignor to R. G. LeTourneau Inc., Longview, Tex.
Filed June 23, 1969, Ser. No. 835,464
Int. Cl. E02f 3/80
U.S. Cl. 214—776 4 Claims



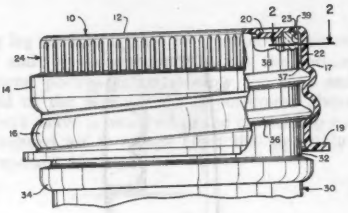
This specification discloses an improvement in a front end loader type vehicle characterized by a linkage arrangement between a tilting means and a bucket that inherently effects a normal ground level loading position of the bucket with the desired tilt attitude when the bucket is merely lowered from its full dump tilt at its top position. No skillful or time-consuming cooperative manipulation between the tilting means and an elevating means is required. To accomplish the above result without significant engineering sacrifices, there is employed, inter alia, a bell crank that has a ratio of lengths of a second lever arm, connected with the bucket, to a first lever arm, connected with the tilting means, of 1.4–2.0. The other components are selected to effect nearly optimum angles of tip back, carry and dump; and to enable elevating the loaded, tilted back bucket to the top without spilling the load by merely elevating the bucket, without adjusting the tilting means.

3,606,062
BOTTLE STRUCTURE FOR CRIMP ON-TWIST OFF CAPS
Jacob O. Frisch and Wayne H. Sanders, Olympia, Wash., assignors to Olympia Brewing Company, Olympia, Wash.
Filed Mar. 9, 1970, Ser. No. 17,364
Int. Cl. B65d 41/04
U.S. Cl. 215—43 5 Claims



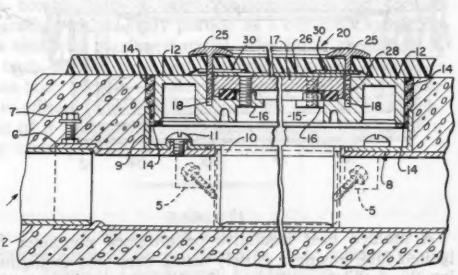
A bottle has its neck portion provided with a multiple thread structure which will receive and hold a pressure applied crown or crimp on type metal cap and which will enable the cap to be more easily twisted off than prior constructions. The lower part of the thread structure terminates in an outwardly projecting circumferential ring having an outer cylindrical surface substantially parallel to the axis of the neck of the bottle. The outer diameter of this ring is substantially equal to the outer diameter of the threads and is positioned on the neck so that the lower edge of the cap contacts the mid portion of this surface. Also the ridges of the mold parting lines on the bottle neck are positioned so that each crosses one thread only near the lower end of the thread.

3,606,063
THREADED PLASTIC CLOSURE
Edmund Childs, Longmeadow, Mass., and Raymond Ostrowski, Florence, S.C., assignors to The KLM Company, Stratford, Conn.
Filed May 22, 1969, Ser. No. 826,973
Int. Cl. B65d 41/04
U.S. Cl. 215—43 6 Claims



A thermoformed screw type closure of semi-rigid material having a plurality of projections located between the uppermost point of the thread and the top of the closure which is recessed to lie inwardly of the root of the thread to engage the neck of a container onto which the closure is to be applied. The projections deform upon screwing down of the closure onto the container producing a good seal and fit and preventing the closure from backing off. A die is also disclosed for making closures of the foregoing type which utilizes the recessed portions of the closure as an aid in removing the closure from the die.

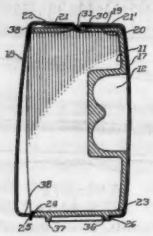
3,606,064
FLOOR COVERING TRIM FOR UNDERFLOOR JUNCTION BOXES
De Forest D. Butler, Oxford, Ohio, assignor to Square D Company, Park Ridge, Ill.
Filed Feb. 2, 1970, Ser. No. 7,762
Int. Cl. H02g 3/08
U.S. Cl. 220—3.8 11 Claims



A plurality of elongated frame members are detachably connected at their adjacent ends to provide a closed

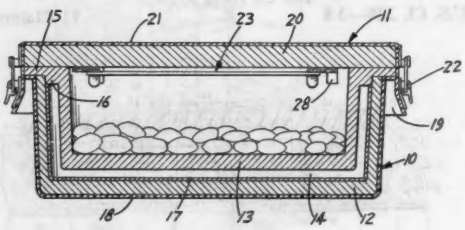
trim frame. Each member is of a T-shape cross section, having a decorative horizontal top wall and a depending side wall. A metal sheet or pan is enclosed by the side wall and faces the top of the frame. It is detachably connectable to the side wall in parallel relation to the plane of the top wall at different selected distances from the top wall by means of tongues on the sheet received in selected openings in the side wall, so as to adapt the frame to different carpet thicknesses. In installed position of the trim frame, the sheet is juxtaposed in load transmitting relation on a junction box cover.

3,606,065
CAMERA ENCLOSURE
Richard K. Carlson, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 854,487
Int. Cl. B65d 7/12; G03b 17/02
U.S. Cl. 220—4R **6 Claims**



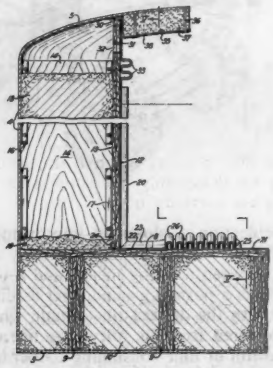
This invention consists of an enclosure which is of shell-like or tubular formation, being of polygonal cross-section and open at its ends in order to fit compatibly about a body member or mechanism having shouldered portions around the body. The enclosure is provided with a hinge on one part of its surfaces, and resilient lips on another part thereof to releasably engage the body member.

3,606,066
INSULATED GRILL AND FIRE BUCKET
Maurice N. Anderson, 3301 Wendhurst Ave. NE., Minneapolis, Minn. 55418
Filed Aug. 28, 1969, Ser. No. 853,774
Int. Cl. B65d 25/18
U.S. Cl. 220—9R **4 Claims**



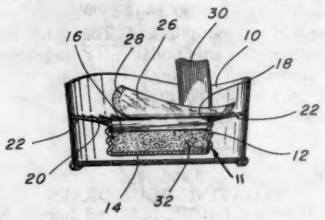
A molded heat insulative open-topped container for ignited fuel, having a closely fitting cover for extinguishing the fuel when placed over the open top. Depending upon its size, the container may be used as a firebox for a cooking grill, or as a receptacle for receiving the fuel from a grill firebox for quickly extinguishing and conserving the fuel for reuse. Preferably the container is molded from a micaceous material admixed with a hardenable binder. Desirably the container is double-walled to reduce its weight and provide an insulating air cell. A liner of heat reflective material may be used within the cell to direct heat from the fuel inwardly to the cooking zone.

3,606,067
STORAGE RECEPTACLE FOR LIQUEFIED GAS
Edward L. Jones, 1281 Beagle Drive, Bethel Park, Pa. 15102
Filed Feb. 6, 1969, Ser. No. 797,200
Int. Cl. B65d 7/22
U.S. Cl. 220—10 **6 Claims**



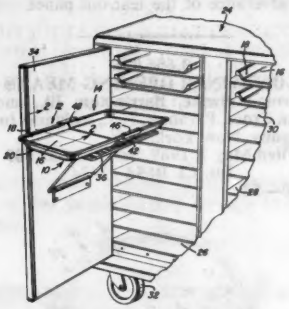
A tank has a relatively flexible side wall enclosed by a jacket that has a rigid side wall spaced from the tank wall. Rigid panels encircling the tank wall in engagement with it are spaced from the jacket side wall by means of vertical struts. The panels and struts are made of material of very low heat conductivity and transfer the outward pressure of the filled tank to the jacket side wall. The space between the panels and the jacket is filled with thermal insulation. The tank is provided with expansion joints to allow its side wall to remain against the panels under all conditions.

3,606,068
CONTAINER WITH INSERT
Charles E. Palmer, Turnpike Road, Somers, Conn. 06071
Filed May 7, 1969, Ser. No. 822,626
Int. Cl. B65d 85/00, 25/00
U.S. Cl. 220—20 **7 Claims**



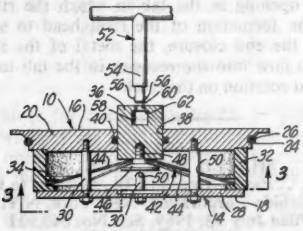
An insert for assembly in a container comprises a body which has an interior recess and a gripping portion projecting outwardly about the periphery thereof. The gripping portion is designed to engage the sidewall of a container so as to secure the insert therein.

3,606,069
DETACHABLE TRAY UNIT
Hertzel Harrison, North Miami, Fla. (% Mercury Manufacturing Co., 226 W. 23rd St., Hialeah, Fla. 33010)
Filed Feb. 19, 1969, Ser. No. 800,548
Int. Cl. B65d 7/08, 7/32
U.S. Cl. 220—23.4 4 Claims



A tray unit incorporating two half tray units and structural devices for detachably interconnecting the units to form a complete carrying tray.

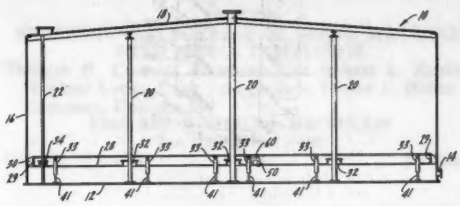
3,606,070
LOCKABLE TANK CLOSURE WITH EXPANDABLE PLUG
Willard W. Shepherd, Whittier, Calif., assignor to Shepherd Machinery Co., City of Industry, Calif.
Filed Oct. 6, 1969, Ser. No. 863,942
Int. Cl. B65d 39/12
U.S. Cl. 220—24.5 8 Claims



A lockable closure for a fuel tank filler opening comprising a frame carrying a radially expandable, annular plug engageable with the periphery of the filler opening to lock the closure therein. The annular plug is expanded radially by a plug expanding means which is responsive to axially inward movement of a central actuator carried by the closure frame adjacent the outer end thereof. The central actuator projects axially outwardly beyond the outer end of the closure frame prior to actuation of the plug expanding means to provide a visual indication that the closure has not been locked. The outer end of the closure frame carries an annular seal engageable with the periphery of the filler opening. The annular plug may be formed of an elastomeric material to provide a second annular seal when the closure is locked.

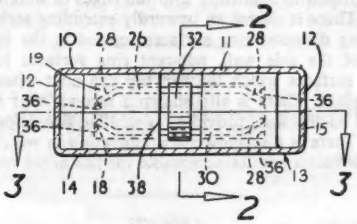
3,606,071
FLOATING ROOF DRAIN
Robert B. Wagoner, Griffith, Ind., and John S. Kinghorn, Houston, Tex., assignors to Aerojet-General Corporation
Filed Feb. 27, 1970, Ser. No. 15,112
Int. Cl. B65d 87/18
U.S. Cl. 220—26D 5 Claims

A method and apparatus for removing liquid from a sunken floating roof of a liquid storage tank. The method comprises the steps of: withdrawing liquid from below the sunken floating roof; and siphoning liquid from above the floating roof to below the floating roof when the liquid lever of the tank is below the accumulated liquid above the floating roof. The apparatus includes a generally inverted U-shaped siphon drain having first and second



upstanding leg portions connected together at their respective upper ends by a connecting portion; the bottom end of the second portion extends below the roof and the bottom end of the first portion is positioned above the roof. A check valve is attached to the connecting portion to allow trapped air to escape from the pipe only in a vertically upward direction.

3,606,072
BOXES, CASES AND THE LIKE
Thomas William Pinchin, Evesham, Worcester, England, assignor to Willmotts Limited, Evesham, Worcester, England
Filed July 25, 1969, Ser. No. 844,941
Claims priority, application Great Britain, Aug. 8, 1968, 37,855/68
Int. Cl. B65d 43/16
U.S. Cl. 220—31S 3 Claims

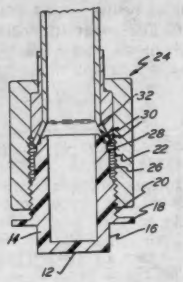


A box includes a body portion and a lid formed integrally with the body portion as a one-piece moulding of a synthetic plastics material. The lid is connected to the body portion by a web extending between side walls of the body portion and lid which are co-planar when the lid is closed. The side walls provide means for attachment of a spring clip which biases the lid into either a fully open position or a fully closed position.

3,606,073
CAP FOR FLARE FITTING
Joseph Anthony Burke, Elizabeth, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Dec. 16, 1969, Ser. No. 885,417
Int. Cl. B65d 41/04
U.S. Cl. 220—39 3 Claims

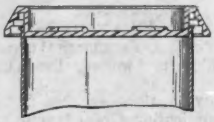
A plastic cap, for pressure-sealing a tubular threaded flare fitting and protecting its threads, is provided with

cooperating threads and a raised thin annular surface on a beveled surface of the cap so that the annular



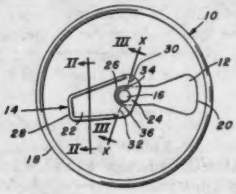
surface engages with a beveled surface of the fitting in sealing relationship.

3,606,074
MULTIPLE PURPOSE GRIPPING LID
Robert M. Hayes, 24 Webster Ave., Somerville, Mass. 02143
Filed July 24, 1969, Ser. No. 844,437
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 **5 Claims**



A multiple purpose lid suitable for open cans and other containers of various sizes has a closed top and a side wall shaped to resiliently grip the edges of different sized cans. There is shown an upwardly extending series of decreasing diameter ring surfaces formed in the inner surface of the side wall, adjacent ring surfaces joined by ledge surfaces which the can top can abut when the lid is in place. There is also shown a second inner side wall joined to the first, providing a smaller size gripping surface. There is also shown a combination in which the lid also defines a coaster acceptable for use in the home.

3,606,075
CONTAINER OPENING DEVICE
Lloyd Graham Dunn, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Jan. 5, 1970, Ser. No. 730
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **8 Claims**

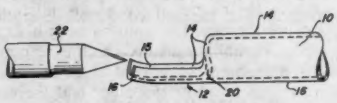


A tab for attachment to a tear-out section in a container wall, which tab has a cut line therein around the side of attachment aperture in the tab adjacent the handle portion of the tab and terminating on a line through the center of the attachment aperture in the tab to form a hinge line through the aperture whereby the handle portion of the tab can be rotated upwardly about the hinge line to form a rigid lever which can be manipulated to initiate rupture of the score line adjacent the attachment of the tab to the panel, and then be pulled to complete severance of the tear-out panel.

3,606,076
CONTAINER OPENING MEANS
Edward Herman Hanke, Barrington, Ill., and Leonard Thomas La Croce, Paramus, N.J., assignors to American Can Company, New York, N.Y.
Filed May 7, 1969, Ser. No. 822,509
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **6 Claims**

In order to prevent rotation of a pull tab about a rivet which secures it to the scored end closure of a container, a plurality of recesses are indented into the upper surface of marginal edge portion of the tab which defines the opening in the tab in which the rivet is received. Upon formation of the rivet head to secure the pull tab to the end closure, the metal of the rivet head is caused to flow into the recesses in the tab to lock the latter against rotation on the rivet.

3,606,077
SHAPED SEAL CLOSURE
Clifford C. Faust, Riverside, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Filed July 23, 1969, Ser. No. 843,921
Int. Cl. B65d *7/42*
U.S. Cl. 220—66 **8 Claims**

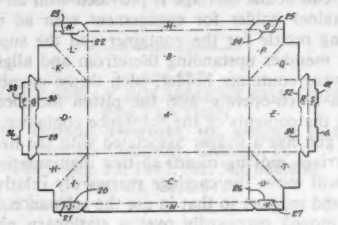


A shaped seal closure for a thermoplastic tubing comprises a diaphragm membrane extending across the tubing and integral with said tubing, and a trough integral with the tubing and coextensive with said tubing. The trough serves as a support and guide for a coupler, a needle or the like which will perforate the diaphragm.

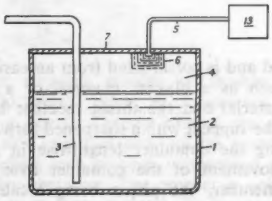
3,606,078
CONTAINER AND BLANK THEREFOR
Floyd L. Phillips, Jr., Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Aug. 1, 1968, Ser. No. 749,374
Int. Cl. B65d *7/42, 5/24*
U.S. Cl. 220—62 **8 Claims**

A container and a blank for a container. The container is flanged at the tops of the sides and ends thereof. The

flange at each end of the container is formed from extensions of the end panel of the container which have sandwiched therebetween locking flange panels that form extensions of the panels joining the end to the sides of the container.

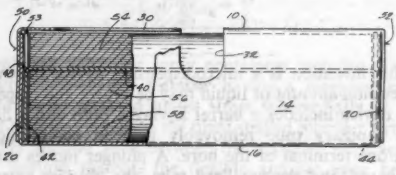


3,606,079
EXPANSION CHAMBERS FOR GAS DISCHARGE OUTLETS
Colin Ashton Eaton, West Drayton, Middlesex, England, assignor to Walter Kidde and Company, Incorporated, Belleville, N.J.
Filed Feb. 14, 1969, Ser. No. 799,378
Int. Cl. B65j *1/02*
U.S. Cl. 220—86 **6 Claims**



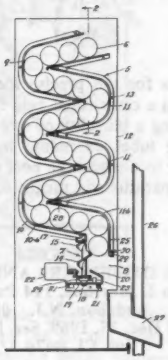
A container for combustible liquids or gases having a gas inlet whereby gas from a gas discharge outlet may be admitted under pressure for expelling the contents of the container, there being provided an expansion chamber at the inlet for ensuring that there is not a large build-up of static electricity in the incoming gas. The expansion chamber comprises flow reducing means for reducing the velocity of the gas as it enters the container and an earthed conductor with which the incoming gas makes intimate contact. The earthed conductor is preferably a wire mesh.

3,606,080
PLASTIC BAG PACKAGE
John E. Lynch, Oshkosh, and Anton Zeller, Neenah, Wis., assignors to Presto Products Inc., Appleton, Wis.
Filed Jan. 29, 1970, Ser. No. 6,835
Int. Cl. B65h *1/04*
U.S. Cl. 221—63 **4 Claims**



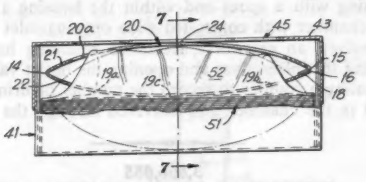
A box having a removable wall portion providing an access slot contains paper or plastic articles wound upon a bridge member formed from a cardboard strip which has its ends wider than its intermediate portion and folded to be abutments and disposed vertically in substantial contact with the ends of the box. Sandwich bags exemplifying the articles packaged have both ends in the lower part of the box, only their intermediate portions lying above the bridge member, the latter being about one-half so far from the top of the box as from its bottom.

3,606,081
SERPENTINE MAGAZINE VENDING MACHINE WITH SPIRAL DISCHARGE
Thomas H. Croteau, Hartford, and Robert L. Renfro, Windsor Locks, Conn., assignors to Walter E. Heller & Company, Chicago, Ill.
Filed Aug. 8, 1969, Ser. No. 848,530
Int. Cl. G07f *11/00*
U.S. Cl. 221—75 **3 Claims**



A vending machine having a serpentine magazine in the form of a chute for storing articles to be vended and a vertical spiral having a helical flange for dispensing said articles one at a time from the front of the machine; the articles being delivered by the chute over the top and down the front of the spiral onto said flange thereof.

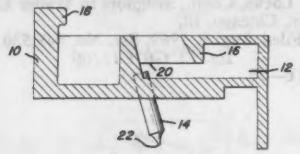
3,606,082
DISPENSING CONTROL MEMBER FOR INTERFOLDED TISSUES
Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, New York, N.Y.
Filed June 4, 1969,, Ser. No. 830,331
Int. Cl. A47k *10/24*
U.S. Cl. 221—52 **12 Claims**



A carton for dispensing interfolded flexible sheet materials which includes a flexible, dispensing control member, having a closed, generally elliptical profile. The control member is constructed from a single, folded sheet, preferably paperboard, the ends of which are seamed together. The control member, as formed, has two vertically aligned openings therein and is fastened to and dependent from the top wall of the dispensing carton so that the openings in the control member are in vertical alignment

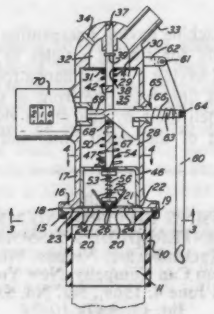
with an opening in the top wall of the dispensing carton, thereby allowing the top sheet in the carton to be grasped by reaching through the opening in the top wall and the openings in the control member.

3,606,083
MEASURING AND TRANSFERRING APPARATUS
Richard L. Simon, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 18, 1969, Ser. No. 851,017
Int. Cl. B67b 7/00
U.S. Cl. 222—1 10 Claims



An apparatus for the precise measurement and transfer of liquids in a centrifugal field is comprised of an annular disk having a plurality of reservoir chambers, capillary measuring tubes extending into the chambers and communicating to a discharge port on the disk, means for rotating the apparatus and means for collecting dispensed liquid.

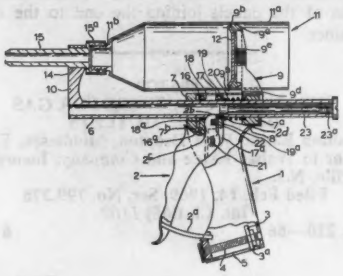
3,606,084
DRINK DISPENSERS AND COUNTER
John J. Morrone, 114 Payson Ave., Audubon, N.J. 08106
Filed Dec. 15, 1969, Ser. No. 884,917
Int. Cl. B67d 5/22
U.S. Cl. 222—38 6 Claims



A drink dispenser and counter is provided having a housing with a spout and within the housing a measuring chamber with controlled wide opening inlet and outlet valves, an exteriorly accessible actuating handle for closing the inlet valves and opening the outlet valve. Also actuating a counter to record the number of drinks measured in the chamber and delivered through the spout.

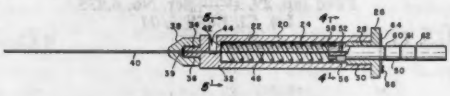
3,606,085
DISPENSING GUN FOR PASTES AND LIKE SUBSTANCES
Ian Butler Spilman, 46 Paynters Ave., New Plymouth, New Zealand
Filed Aug. 25, 1969, Ser. No. 852,607
Claims priority, application New Zealand, Aug. 26, 1968, 153,576
Int. Cl. B67d 5/22
U.S. Cl. 222—43 21 Claims

A dispensing gun for delivering substances such as pastes, for example for delivering medicinal pastes in the form of a drench to farm stock, the gun including a pistol butt handle with a support at its upper end and a carriage is slidably engaged in guides in the support. The forward end of the carriage is provided with an upstanding container holder for engagement with an outlet or dispensing nozzle for the container and the support has a thrust member upstanding therefrom and aligned with the forward container holder, such thrust member being arranged to co-operate with the piston member for expressing the contents of the substance container. The dispensing gun has a trigger associated with the handle and with carriage moving means so that manipulation of the trigger will move the carriage rearwardly relative to the handle and support so that in use the substance container is also moved rearwardly over a stationary piston and thrust member. Preferably the container is of the dispos-



able kind and is constructed from an easily severable material such as a plastics material or a thin soft metal alloy material and the thrust member has a connecting part to the support with a sharpened forward edge capable of slitting the container lengthwise in permitting rearward movement of the container over the piston and thrust member, the piston being located forwardly of the sharpened connecting portion between the thrust member and support. The piston member for the container can be formed initially integrally with the walls of the container and be subsequently separable therefrom. The gun is also provided with an adjustable stop means to limit the trouble of the trigger relative to the handle in controlling the amount of paste to be dispensed from the container.

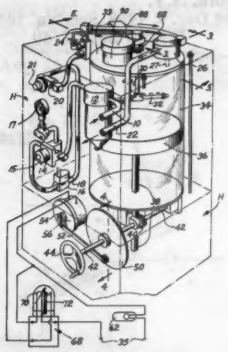
3,606,086
MICRODISPENSING DEVICE
Michael E. Drummond, Springfield, and John E. Robinson, West Chester, Pa., assignors to Drummond Instrument Company, Broomall, Pa.
Filed Nov. 10, 1969, Ser. No. 875,082
Int. Cl. B67d 5/22
U.S. Cl. 222—49 12 Claims



This invention is a microdispensing device into which a precision amount of liquid may be drawn and dispensed. The device includes a barrel having a bore and a disposable capillary tube removably held in communication with one terminal of the bore. A plunger moves through the barrel and the capillary tube, the plunger extending through an end cap in the opposite terminal of the barrel. Uniformly spaced annular recesses in the outer periphery of a plunger holder selectively engage a wire spring detent for determining by "feel' the amount of liquid dispensed.

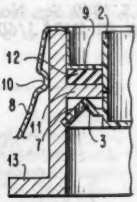
Travel limiting inserts removably positioned in the barrel regulate the length of the plunger stroke and consequently the amount of liquid drawn into and dispensed from the device.

3,606,087
POWDER SPRAY EQUIPMENT FOR OFFSET PREVENTION
Laurice W. Ortman, Deerfield, Ill., assignor to Ortman-McCain Company, Chicago, Ill.
Filed Aug. 11, 1967, Ser. No. 660,052
Int. Cl. B67d *5/08*
U.S. Cl. 222—64 3 Claims



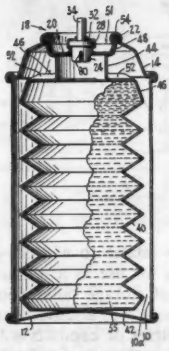
Equipment for spraying powder on freshly printed sheets of paper to prevent offset. A compressed air line discharges from a nozzle directed toward the sheet of paper and has a side inlet that picks up the powder from a container. To effect such pick-up, compressed air pressurizes the powder container. The powder is agitated in the container so as to form a cloud. To insure uniform consistency of the cloud a constant level of powder is maintained in the container.

3,606,088
MEMBRANE VALVE FOR SPRAY CONTAINERS
Walter Baltzer, Bad Ems, Germany, assignor to Beleggingsmaatschappij "Industriebank" N.V., The Hague, Netherlands
Filed Dec. 2, 1968, Ser. No. 780,321
Int. Cl. B65d *33/00*
U.S. Cl. 222—94 32 Claims



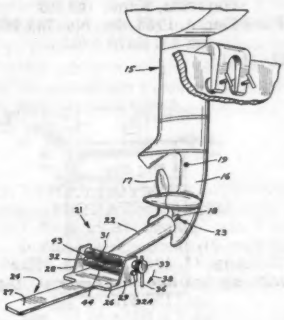
Membrane valve for spray containers includes a substantially plate-shaped member having a marginal edge adapted to be retained under stress substantially at the wall of a spray container, the plate-shaped member having a flexible annular zone between the marginal edge and a center portion thereof, the flexible annular zone being formed with an opening therethrough, an annular sealing lip formed on one side of the plate-shaped member around the center portion thereof and being prestressed into engagement with a valve seat and defining a closed chamber therewith and means for disengaging the annular sealing lip from the valve so as to provide communication between the chamber and the other side of the plate-shaped member through the opening in the flexible annular zone thereof.

3,606,089
PRODUCT-ISOLATING SACK FOR PRESSURIZED DISPENSERS
Charles D. Chambers, Huntington, Conn., assignor to Valve Corporation of America, Bridgeport, Conn.
Filed May 19, 1969, Ser. No. 825,787
Int. Cl. B65d *35/28*
U.S. Cl. 222—95 3 Claims



A vertically collapsible product-isolating sack having a reduced neck portion at its top, through which the produce passes, and having below said neck portion an externally grooved annular shoulder adapted to fit within the top shoulder of the dispenser casing and to provide pasages within the casing shoulder for the charging of the casing with propellant liquid. During said charging the sack neck is supported above the casing neck and in spaced relation thereto, and the propellant liquid passes through the existing space between the necks and through the grooves of the sack shoulder, being brought into the casing.

3,606,090
DEVICE FOR DISPENSING MATERIAL FROM A TUBE
Orva W. Byers, 3035 Dutch Lane, Mound, Minn. 55364
Filed July 2, 1969, Ser. No. 838,537
Int. Cl. B65d *35/28*
U.S. Cl. 222—102 16 Claims



A device for progressively squeezing a flexible tube to inject fluid lubricant into the lower gear case of an outboard motor. The device has a frame carrying a pair of

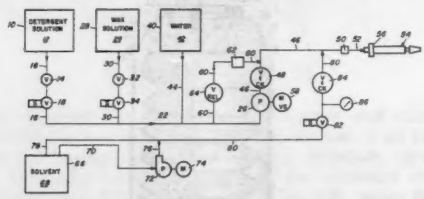
side-by-side rollers operable to squeeze a flexible walled tube. The tube has an outlet carrying an adapter threadably secured to the lower gear case of the outboard motor. Located within the adapter is a one-way cone-shaped valve operable to prevent reverse flow of lubricant from the gear case into the tube. The adapter containing the one-way valve can be an integral part of the outlet nipple of the tube.

3,606,091

MULTI-PRESSURE LIQUID DISPENSER SYSTEM

Leo A. Grisham, 1205 McKinley Ave., Ashland, Ky. 41101

Filed Mar. 31, 1970, Ser. No. 24,135
Int. Cl. B67d 5/60
U.S. Cl. 222—132 9 Claims



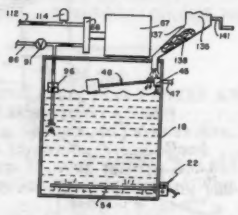
This disclosure relates to a multi-pressure liquid dispensing apparatus for use in a self-service car wash system. A plurality of storage tanks containing a detergent solution, a wax solution, a solvent and water are interconnected by a series of conduits so that washing, rinsing, waxing and degreasing operations may be performed on an automobile. The apparatus utilizes a single hand-held spraying nozzle for dispensing the different solutions, and a rotary switch is provided for activating solenoid valves and two pumps so that the different liquids can be combined and dispensed through the nozzle. The washing and rinsing operation uses the high speed output of a variable speed motor to operate one of the pumps to produce high pressures for the operation. The waxing operation uses the low speed output of the variable motor. The degreasing operation uses the other pump at an extremely low pressure. During the washing operation, water and the detergent solution are used; the rinsing operation dispenses only high pressure water, the waxing operation dispenses a wax solution and water, and the degreasing operation dispenses only the solvent. Since these are dispensed through a single nozzle, the vehicle can remain in one location for all four operations.

3,606,092

MULTIPLE FLUID WASHING APPARATUS

Klaus E. Kollmai, 211 S. Main Ave., Haysville, Kans. 67060

Filed Dec. 4, 1968, Ser. No. 781,003
Int. Cl. B67d 5/60
U.S. Cl. 222—144.5 4 Claims



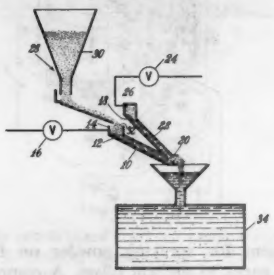
This invention is a compact fluid dispensing apparatus including a support means having heated, cleansing fluid therein; a pressure spray apparatus mounted upon the support means operable to impart pressure to a fluid received; a second fluid source connectable to the support means to add the second fluid to the cleansing fluid solution and, additionally, to supply the fluid directly to the spray apparatus for dispensing therefrom during the rinsing cycle; a heater element secured to the support means to heat the cleansing fluid; and a chemical supply means to add the required chemical to the cleansing fluid with the second fluid to maintain a consistent cleansing fluid mixture.

3,606,093

DISPERSING DEVICE AND PROCESS FOR USE

Frederick J. Morse, Monroe, N.Y., and Lincoln A. Carter, Ringwood, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 9, 1968, Ser. No. 782,126
Int. Cl. B67d 5/60
U.S. Cl. 222—145 2 Claims



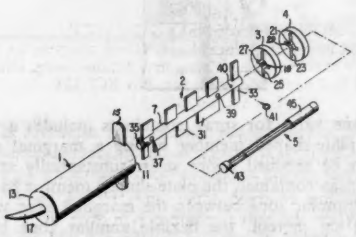
A dispersing device which is useful in the preparation, under the non-shearing conditions, of solutions of materials which ordinarily are difficult to dissolve, is comprised of at least one surface over which passes a thin film of liquid, a dispenser for dispensing a narrow sheet of finely divided material onto the film and at least one mechanism for controlling the liquid flow and dispensing rates so as to provide a predetermined concentration of material in the solution.

3,606,094

MIXING AND DISPENSING SYRINGE

Peter B. Mills, 3502 Spring Circle, Decatur, Ga. 30032, and Arthur B. Silver, 3510 Rosewell Road NE., Apt. M-3, Atlanta, Ga. 30305

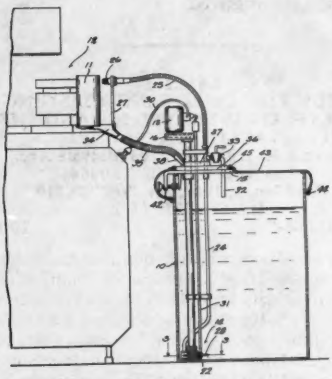
Filed June 5, 1969, Ser. No. 830,672
Int. Cl. B67d 5/60
U.S. Cl. 222—145 7 Claims



A mixing and dispensing device having a housing suitable for containing a fluid, a fluid outlet and containing a

mixing device movable between first, second and third positions, such that when the mixing device is in its first position, the device is contained within the housing so as to be capable of subjecting a fluid contained within the housing to a mixing action, when the mixing device is in its second position, the device is partially removed from the housing and engagedly attached to a stopper, and when the mixing device is in its third position, the mixing device is again contained within the housing in engaging relationship with the stopper so as to form a piston which is used to urge a fluid contained within the housing through a fluid outlet.

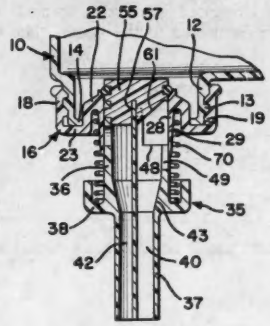
3,606,095
FEEDER FOR HIGH VISCOSITY LIQUIDS
Hermann Kronseder, Berliner Str. 10, Neutraubling, Germany
Filed Aug. 26, 1968, Ser. No. 755,221
Claims priority, application Germany, Sept. 7, 1967, P 15 86 372.6
Int. Cl. B67d *5/62*
U.S. Cl. 222—146HE **5 Claims**



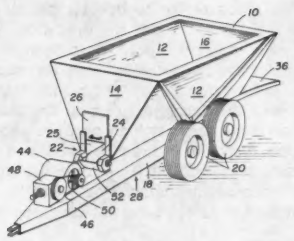
This disclosure relates to a portable feeder for high viscosity liquids, such as glue, in which a motor and pump are assembled unitarily with a hanger bracket by which the feeder may be hung on the side of a liquid container with the pump immersed in the liquid. The pump desirably has gears which protrude from the pump housing at the intake side to insure adequate loading of the liquid into the gear teeth. There is a heater adjacent the pump to soften highly viscous liquid such as glue.

3,606,096
LIQUID DISPENSING DEVICE
Charles G. Campbell, Miamisburg, Ohio, assignor to The Huffman Manufacturing Company, Miamisburg, Ohio
Filed Sept. 30, 1969, Ser. No. 862,351
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **10 Claims**

A container is provided with a dispensing device including a cap-like housing which supports a spring-biased tubular valve member defining separate liquid and air passages having enlarged inner ends closed by a plug member. When the valve member is moved to its open position, the liquid passage opens through a large inlet to the container chamber prior to the air passage, and the end of a sleeve on the housing forms a seal with the valve member. When the valve member is moved to its closed position, the liquid passage opens directly to atmosphere so that no liquid is entrapped within the passage. The cap-like housing has an inner surface which cooperates with the neck of the container to form a radially expanding liquid tight seal therebetween.



3,606,097
APPARATUS FOR DISTRIBUTING GRANULAR MATERIAL AND THE LIKE
George B. Wall, Delhi, Iowa, assignor to Air-Spread, Inc., Delhi, Iowa
Filed July 15, 1969, Ser. No. 841,921
Int. Cl. A01c *15/04*
U.S. Cl. 222—176 **11 Claims**

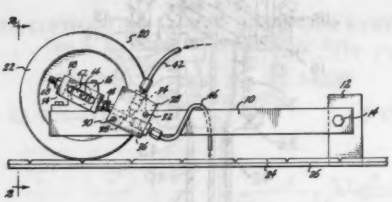


An apparatus for distributing granular material such as fertilizer or salt-sand mixtures for ice control, by using air as the conveying medium and propelling force to distribute the material over a selected area. The apparatus is used on mobile equipment either in crop farming or in ice control for highways and streets.

3,606,098
CONDITIONING LIQUID DISPENSER FOR A CONVEYOR
Charles A. Genther, 8180 Merrimount Drive, Mercer Island, Wash. 98040
Filed July 11, 1969, Ser. No. 840,969
Int. Cl. G01f *11/06*
U.S. Cl. 222—309 **10 Claims**

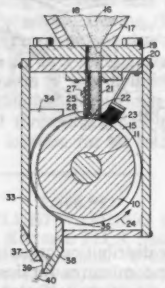
A reciprocating piston type metering device is secured to a support arm. A large diameter drive wheel is connected to one end of the axle; a small diameter cam wheel is connected to the opposite end of the axle; a

bearing rotatably supports the axle on the support arm. The support arm is pivotally connected to a frame portion of a conveyor at a location placing the drive wheel in contact with a traveling runner of the conveyor. An eccentrically mounted pin extends axially from the cam wheel into an elongated guide slot formed in the side wall of a yoke connected to the piston. The cam wheel



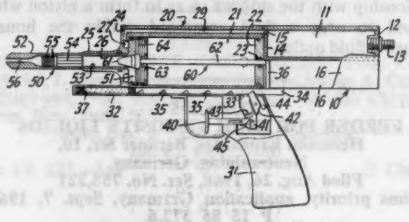
is between two end walls of the yoke which are spaced radially outwardly from the periphery of the cam wheel. An adjustable stop (e.g. a bolt) is threadably received in the end wall of the yoke distal the piston. A first conduit delivers conditioning liquid to the inlet of the metering device, and a second conduit leads from the outlet of the metering device to a discharge position above the conveyor runner.

3,606,099
APPARATUS FOR THE UNIFORM DELIVERY OF GRANULAR MATERIAL
John F. Benson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 26, 1970, Ser. No. 5,613
Int. Cl. G01f *13/00*
U.S. Cl. 222—312 **8 Claims**



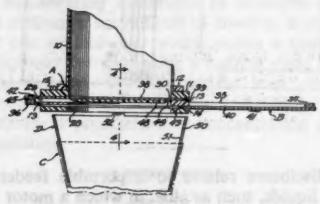
An apparatus for continuously delivering a uniform supply of granular material, e.g. granular table salt, for application upon the surface of edible products, e.g. potato chips, moving beneath the applicator apparatus. The applicator is characterized by a continuously rotating drum having an annular groove which receives granular material from a feed tube projecting into the groove. An adjustable flow control gate projects radially into the groove. A flow control slot is formed between the gate and the groove which may be varied in width to control the flow of granules as the drum rotates. Granules flowing through the slot are conveyed in the groove to a chute where they fall by gravity until striking a series of baffles whereupon they are deposited upon the surface of the product being coated.

3,606,100
DEVICE FOR DISPENSING A CONCENTRATED FLUID STREAM
William E. Stapf, Alexandria, Va., assignor to AMF Incorporated
Filed Feb. 13, 1970, Ser. No. 11,210
Int. Cl. G01f *11/00*
U.S. Cl. 222—320 **8 Claims**



A device for dispensing a concentrated fluid stream with substantial force utilizing a pressure fluid medium which does not effect the stored fluid to be dispensed until the device is triggered.

3,606,101
APPARATUS FOR DISPENSING CLINGING SUBSTANCES SUCH AS SHAVED ICE AND THE LIKE INTO RECEPTACLES
Clarence R. Wilhelmi, 2203 Midvale Ave., Los Angeles, Calif. 90064
Filed Jan. 2, 1969, Ser. No. 788,519
Int. Cl. G01f *11/28*
U.S. Cl. 222—447 **10 Claims**

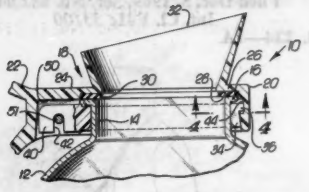


A dispenser for substances such as flaked ice which tends to cling to the dispenser surfaces, wherein a cutter blade and support plate, moving in unison in vertically spaced planes, are operable to remove a measured quantity of the substance from the bottom of a column thereof in a hopper, and to dispense it through a delivery funnel with a positive stripping action.

3,606,102
BEVERAGE DECANTER HANDLE AND SPOUT ASSEMBLY STRUCTURE
Thomas M. Lowry, Hacienda Heights, and Charles W. Punton, Pacific Palisades, Calif., assignors to Margaret A. Curtis, North Hollywood, Calif.
Filed June 20, 1969, Ser. No. 835,002
Int. Cl. A47j *19/14*
U.S. Cl. 222—475 **9 Claims**

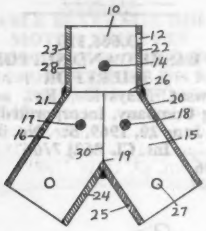
Aparatus for attaching a handle and pouring spout assembly to the neck of a glass flask having an outwardly beaded upper edge. A split locking ring engages around the neck of the flask under the bead, and a collar forming a part of the handle and spout assembly is engaged at

the front thereof by tongue and groove means with the locking ring, and is pivoted downwardly and rearwardly into overlapping relationship over the flask bead, and



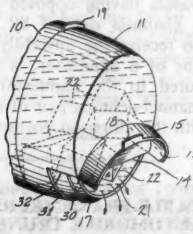
the ring and handle and spout assembly are interlocked proximate the rear of the collar to secure the assembly to the neck of the flask.

3,606,103
DIVIDER SPOUT
Billy R. Taylor, 210 Willow Wood, Levelland, Tex. 79336
Filed Oct. 29, 1968, Ser. No. 771,389
Int. Cl. B67d *3/00*
U.S. Cl. 222—478 **2 Claims**



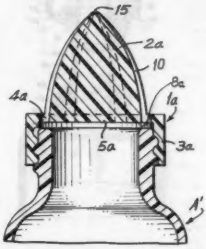
A divider spout having scatter bars positioned to divide and disperse a gravity flow of material to the lower chambers and median dividing point of the inside lower chamber walls to result in division of this material.

3,606,104
CARAFES
Carl H. Rickmeier, Jr., Sheboygan, Wis., assignor to The Vollrath Co., Sheboygan, Wis.
Filed Nov. 10, 1969, Ser. No. 875,341
Int. Cl. B65d *5/72*
U.S. Cl. 222—498 **5 Claims**



A plastic drinking water carafe provided with a removable cover having an integral hinged lid portion which is normally yieldably snap-locked in a closed condition but which cover lid can be readily manually released for swinging movement upwardly to an open position to expose a restricted opening through which water can be poured from the carafe, said discharge opening being small enough to prevent ice cubes in the carafe from falling therefrom, which can cause annoying splashing or spillage.

3,606,105
ROTARY AND LONGITUDINALLY MOVABLE CAP WITH AXIAL DISCHARGE
Anthony Santore, 249 Calhoun Ave., New York, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,994
Int. Cl. B67d *3/00*
U.S. Cl. 222—520 **6 Claims**

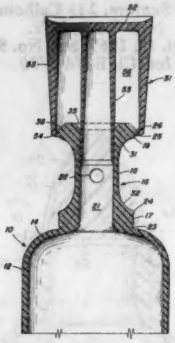


A "squeeze-container" dispenser in which a cap, which is axially movable on the neck of the container between a sealing position and a dispensing position, has a first annular portion which, when said cap is in said sealing position thereof, is in engagement with the upper lip of the container for forming therewith a fluidtight circumferential seal, and said cap having a second annular portion which forms a substantially air-tight circumferential seal with the periphery of the neck of the container in both said positions. The cap is provided with at least one fluid passage located intermediate the aforesaid annular portions for permitting fluid to be dispensed therethrough when the cap is in said dispensing position thereof, and in response to squeezing the container.

3,606,106
TAMPERPROOF ACTUATOR
Edward R. Yuhas, Yonkers, N.Y., assignor to Fluid Chemical Company, Inc., Newark, N.J.
Filed June 19, 1969, Ser. No. 840,120
Int. Cl. B65d *47/10*
U.S. Cl. 222—541 **7 Claims**

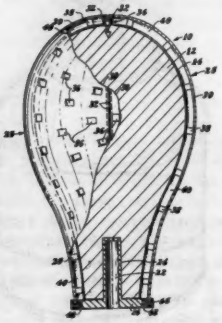
A tamperproof actuator, for the dispensing of contents of a container, preventing dispensing and loss of contents of the container prior to initial use by the ultimate purchaser thereof.

3,606,107
PUSH-PULL CONTAINER AND CAP ASSEMBLY
Gerald J. Ardito, Bayside, Jerome S. Newman, Floral Park, and Samuel E. Sarris, Jamaica, N.Y., assignors to Inventions Unlimited Incorporated, Glen Oak, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,583
Int. Cl. B65d *47/12*
U.S. Cl. 222—546 20 Claims



A material dispensing container provided with an elongated neck having a dispensing orifice in the side thereof. The neck of the container is also provided with engaging recesses. The cap of the container has a plunger which extends into the neck of the container and an outer portion which fits over the container neck. The lower extremity of the outer portion of the cap is provided with an inwardly extending peripheral engaging lip which cooperates with the engaging recesses of the neck of the container in open and closed positions. The plunger may also be provided with a resilient skirt which is compressed within the neck and outwardly biased to provide for sealing engagement, notwithstanding tolerance discrepancies.

3,606,108
WIG SUPPORT
Ronald K. Baugh, Indianapolis, Ind., and Susan L. Mattox, West Carrollton, Ohio, now by change of name to Susan L. Baugh, by marriage (both of 1105G Westfield Court, Indianapolis, Ind. 46220)
Filed June 22, 1970, Ser. No. 48,120
Int. Cl. A41g *5/00;* A41h *3/00;* D06c *15/00*
U.S. Cl. 223—66 6 Claims



A wig support device which provides for the circulation of air interiorly of the wig supported on the device.

3,606,109
GUN SLING
Edward C. Brokus, 4050 Herman Ave. SW., Wyoming, Mich. 49509
Filed Dec. 5, 1969, Ser. No. 882,641
Int. Cl. F41c *33/00*
U.S. Cl. 224—1A 4 Claims

A gun sling including a socket-shaped stock receiver pivoted at its forward end to the underside of the stock of a gun, the rear of the receiver being connected to a strap extending to a conventional strap terminal on the front portion of the gun.

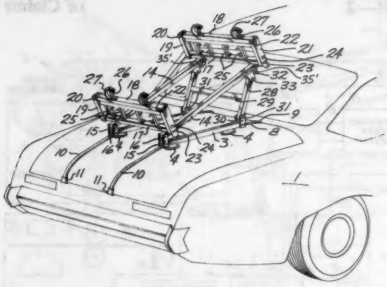
3,606,110
BICYCLE BASKET AND SUPPORT MEANS THEREFOR
Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated, Maysville, Ky.
Filed June 20, 1969, Ser. No. 835,194
Int. Cl. B62j *7/06*
U.S. Cl. 224—36 10 Claims

A bicycle basket having opposed side walls, each of which include channels defined by a pair of laterally spaced wires to receive the upwardly and outwardly extending portions of a handlebar, is securely though releasably anchored to the handlebar by clamps which engage each channel-defining pair of spaced wires at their intersection with the aforesaid portions of the handlebar.

3,606,111
TILTABLE FRAME SKI RACK FOR AUTOMOBILE TRUNK LIDS
Donald J. Gjesdahl, 320 W. Republican, Seattle, Wash. 98109
Filed Apr. 21, 1969, Ser. No. 817,799
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1F 1 Claim

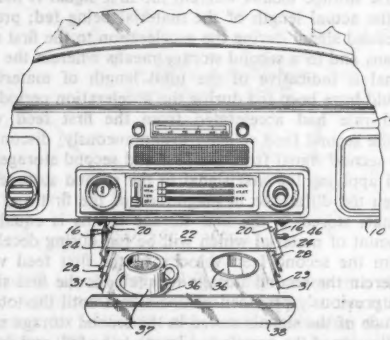
A ski rack frame is mounted on base bars by direct pivots and pivoted struts which are spaced apart. At least one end of each strut is displaceable relative to the direct

pivot so as to alter the angle between the strut and the ski rack frame for, in turn, changing the angle of tilt between such frame and the base bars. Posts of molded plastic can be secured in desired selected positions on the rack



frame and an apertured stretchable strap can be applied easily to a post and secured in position on it by projections to bind an object to such post.

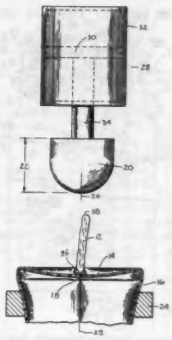
3,606,112
RETRACTABLE BEVERAGE HOLDER FOR MOTOR VEHICLES
Leonard A. Cheshier, 830 Fairwood, Dallas, Tex. 75232
Filed Jan. 28, 1970, Ser. No. 6,414
Int. Cl. B60r *7/00*
U.S. Cl. 224—42.44 **5 Claims**



A beverage holder for motor vehicles adapted for attachment to the instrument panel thereof and retractable beneath the panel, its telescoping frame members providing for maximum extension while affording compact retractability. The device includes a conveniently accessible coin dispensing feature and means for attaching thereto such accessories as tissue dispensers and litter bags.

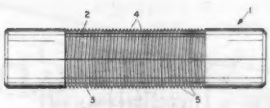
3,606,113
REMOVING WASTE FROM A MOLDED ARTICLE
Howard Lichtman, Windsor, Conn., and Lawrence A. Martino, Trenton, N.J., assignors to Monsanto Company, St. Louis, Mo.
Filed Jan. 26, 1970, Ser. No. 5,681
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **7 Claims**

A projecting, fin-like waste tail, preferably made of a relatively stiff thermoplastic, is detached from the base of a molded article along a thin interconnecting web by a method which involves striking the tail with a curved surface moving toward the base to deflect the tail along the advancing surface and cause a limited surface portion of the tail to contact the base. Continued movement of the advancing surface breaks the tail away from the



base along the web about the limited surface portion which acts as a fulcrum during separation. The apparatus includes a reciprocally mounted specially rounded striking surface.

3,606,114
FIBRILLATION OF STRIATED FILMS
Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Dec. 23, 1969, Ser. No. 887,569
Int. Cl. B26f *1/20, 3/02*
U.S. Cl. 225—3 **2 Claims**

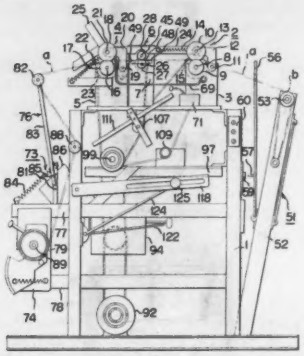


A method is taught of fibrillating a striated film by contacting a film with a helically grooved fibrillation device having on its surface at least one section comprising left-handed helical threads and the same number of sections having right-hand helical threads. The threads are disposed in such a way that at the point where right and left-hand threads meet, the threads of one section abut the grooves between the threads on the other section. The total number of threads per inch on the surface of the device is approximately equal to the number of striations per inch on the film to be fibrillated.

3,606,115
APPARATUS FOR PRODUCING THERMOPLASTIC RESIN SPLIT YARNS
Mitsuo Matsui, Ashikaga-shi, Japan, assignor of a fractional part interest to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan
Filed Dec. 20, 1968, Ser. No. 785,685
Claims priority, application Japan, Dec. 28, 1967, 43/83,834
Int. Cl. B26f *3/02*
U.S. Cl. 225—97 **16 Claims**

The invention relates to an apparatus for producing a split yarn at a high speed and with a high efficiency,

which split yarn has an excellent feeling, that is, its feel is soft, has warmth and is pliable to touch as well as in appearance. The split yarn is formed by passing a synthetic thermoplastic resin film or strip between a splitter, consisting of an assembly of alternately arranged coaxial-



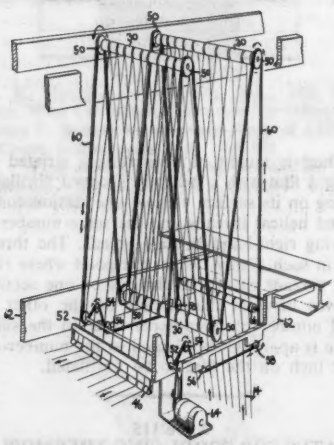
ly disposed thin pieces spaced apart by distance pieces, and a holding member rotating independently and positively in synchronism with said splitter, whereby the strip is split.

3,606,116

PROCESS AND APPARATUS FOR FESTOONING FIBROUS STRAND

John Kallenborn, Murrysville, and George B. Zurheide, Upper St. Clair, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 3, 1970, Ser. No. 16,004
Int. Cl. B65l *17/00*
U.S. Cl. 226—1 **6 Claims**



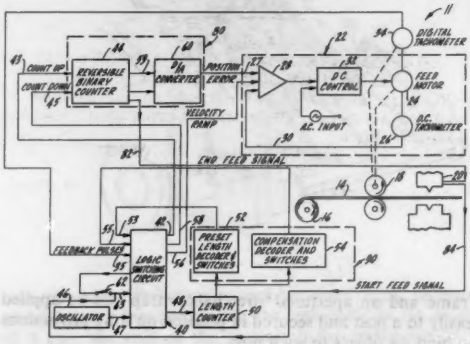
A method and apparatus for festooning a plurality of parallel fibrous strands over support means provided at opposite ends of an elongated heating chamber and, when required by breakage of one or more of the strands, for replacing broken strand by lifting the remaining strands from at least one of said support means and introducing additional fibrous strand in parallel, coplanar, running alignment therewith.

3,606,117

MATERIAL POSITIONING CONTROL

John C. Fagan, Oaklawn, and Robert L. Billingsley, Hazel Crest, Ill., assignors to Amtron, Inc., Midlothian, Ill.

Filed Feb. 27, 1970, Ser. No. 14,951
Int. Cl. B65h, *23/18*
U.S. Cl. 226—2 **16 Claims**



There is disclosed a method and a control system for carrying out the method for feeding a preselected length of material to a utilization device in a minimum feed time comprising the steps of: accelerating the feed rate of said material from an initial first feed velocity, for example, zero velocity, to a second feed velocity, for example, a preselected maximum feed velocity; providing a first signal to a first storage means wherein the first signal is indicative of the actual length of the material being fed; providing a second signal during the acceleration to the first storage means and to a second storage means wherein the second signal is indicative of the total length of material that would have been fed during the acceleration period if said feed rate had accelerated from the first feed velocity to the second feed velocity instantaneously; disconnecting the second signal from the first and second storage means and applying the first signal to the second storage means when the difference in magnitude of the first and second signals stored in the first storage means is equal to the amount of material which will be fed during deceleration from the second feed velocity to the first feed velocity, wherein the second storage means adds the first signal to the previously provided second signal until the total magnitude of the signals stored in the second storage means is indicative of the preselected length to be fed; and decelerating the feed rate from the second feed velocity to the first feed velocity whereby the length of material being fed during the deceleration is determined by the difference in magnitude between the second signal and the first signal stored in the first storage means thereby feeding a preselected length of material to a utilization device in a minimum feed time.

3,606,118

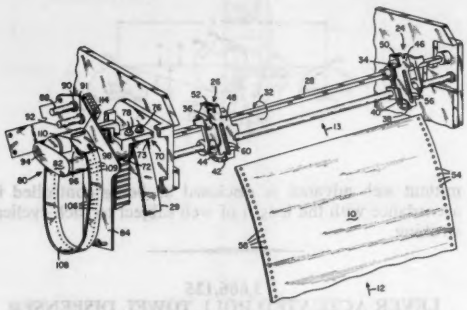
WEB DRIVING SYSTEM WITH CONTROL CIRCUIT FOR HIGH SPEED SLEWING

Sebastian W. Piccione, Norristown, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 12, 1970, Ser. No. 14,814
Int. Cl. G11b *19/26*
U.S. Cl. 226—9 **14 Claims**

A control circuit for a high speed web driving system includes a plural stage shift register for receiving groups of coded vertical format signals, and a first decoder for decoding each group of coded signals stored in the register and for determining presence of a stop code in the register, to cause generation of a control signal for advancement of web speed from low speed slew to high speed slew

when no stop code is in the register. A second decoder decodes the coded group at a predetermined stage of the register to determine presence of a stop code a predeter-



mined number of lines from the stop position on the web, and effects deceleration of the web from high speed slew to low speed slew upon decoding of a stop code thereat.

3,606,119

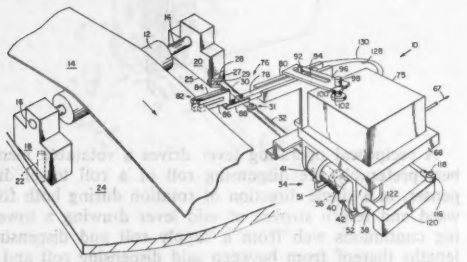
WEB REGISTRY CONTROL APPARATUS

John G. Callan, Sharon, Mass., assignor to Knox, Inc., South Walpole, Mass.

Continuation-in-part of application Ser. No. 694,713, Dec. 29, 1967, now Patent No. 3,504,835. This application Feb. 27, 1970, Ser. No. 15,063

Int. Cl. B65h *25/26*

U.S. Cl. 226—20 **6 Claims**



Apparatus is provided for detecting movements of a moving web out of registry with equipment operating thereon and for actuating adjustment mechanism to restore registry. The detector is designed to produce opposite actuation of the adjustment mechanism according to movements of the web from registry with a nul zone of the detector to registry with operating zones thereof at either side of the nul zone. The detector is mounted on a movable arm which is moved by feedback mechanism in proportion to adjustment actuation in the direction to restore registry of the nul zone with the web when a movement of the web away from such registry terminates. The feedback enables adjustment proportional to web movement with simple on-off type controls.

3,606,120

CONTINUOUS BAND WIDTH CONTROLLER AND BAND DIRECTOR

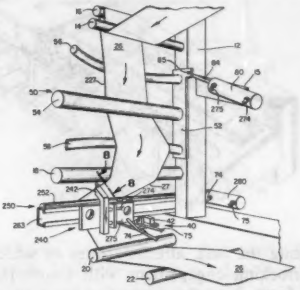
William Kirk Wyatt, Lansdale, and John R. Brownell, Telford, Pa., assignors to Turbo Machine Company, Lansdale, Pa.

Filed June 23, 1969, Ser. No. 835,614

Int. Cl. B65h *25/08*

U.S. Cl. 226—22 **10 Claims**

A control means for the adjustment of the band width of a moving band of continuous material and for directing the traverse of the band as it passes over a plurality of tensioning bars; the band being subject to deviations in its width and its lateral position due to its inherent properties in such an environment. The means comprises at least one bar presenting a curved surface to one face of the band, said surface, upon engaging said face, causing said band to spread or become narrower in accordance with the disposition of said curved surface, and a bar



contacting the face of the band of material and capable of being tilted with respect to the dominant moving plane of said face by means disposed at the end of said bar, and most preferably by means connected to said bar within the range of its contact with said face to pivot said bar about a point removed from the axis thereof. Both bars are actuated by amplifier-controller servo systems which are constantly error sensitive.

3,606,121

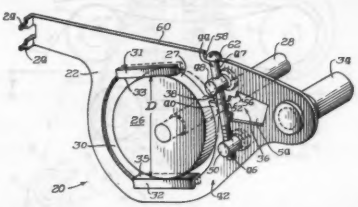
MOTION PICTURE PROJECTOR SHUTTLE

Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1969, Ser. No. 889,535

Int. Cl. G03b *1/22*

U.S. Cl. 226—62 **7 Claims**



An improved intermittent film moving mechanism for use in motion picture apparatus is provided. The mechanism includes a pulldown cam disposed within an intermediately located central opening of a shuttle having two cam engaging surfaces and film engaging members. A slot, having opposed sides, is formed within the shuttle and extends into the central opening of the shuttle, and a screw is positioned across the slot and secured to the shuttle adjacent the opposing sides of the slot for opening and closing the slot and thus changing the configuration of the shuttle and the position of the cam engaging surfaces relative to the cam.

3,606,122

PIN-FEED TRACTOR FOR PAPER WEBS

Ronald W. Brewster, Villa Park, Ill., and Raymond E. Connor, Durham, N.H., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.

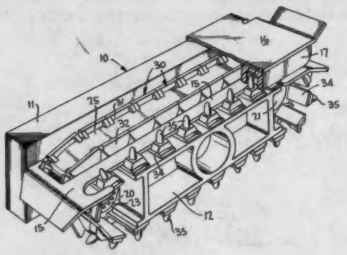
Filed Apr. 17, 1969, Ser. No. 817,022

Int. Cl. B65h *17/38*

U.S. Cl. 226—74 **6 Claims**

The tractor type of pin-feed device for feeding marginally perforated paper webs such as continuous business

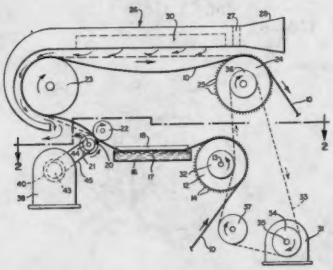
forms to, from, or through imprinting or handling machines, presents perculiarly configured endless belts, pin-carrying elements or clips, and drive sprockets therefor. The pin elements are detachable from the endless belt and are preferably made of plastic although for some purposes metal may be used. A series of transverse ribs are provided along the belt, alternate ones of which are spaced for interlocking engagement with transverse notches or recesses formed on the respective pin elements. Substantially coincidentally with these notches, the pin elements are themselves provided with downwardly projecting transversely disposed rib portions or protuberances.



3,606,123
WEB HANDLING APPARATUS

Nils L. Hakanson, West Springfield, Mass., assignor to The Plastic Coating Corporation, Hampden County, Mass.

Filed Dec. 23, 1968, Ser. No. 785,993
Int. Cl. G11b *15/43*
U.S. Cl. 226—76 **9 Claims**



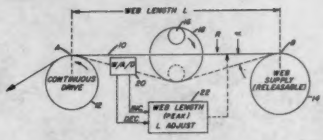
Apparatus including a combination of elements enabling a continuous web to be sprocket fed into a pressure nip without creating wrinkles or causing tracking problems of the web, including two parallel spaced-apart moveable series of sprocket pins engaging the web and advancing it at a predetermined speed, two pressure rolls spaced-apart from the series of sprocket pins and forming a pressure nip through which the web passes following its disengagement from the sprocket pins, and drive means for driving at least one of the rolls so as to maintain tension in the portion of the web running from the sprocket pins to the pressure nip.

3,606,124
INTERMITTENT MOVEMENT

Howard F. Ott, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,878
Int. Cl. B65h *17/02*
U.S. Cl. 226—113 **6 Claims**

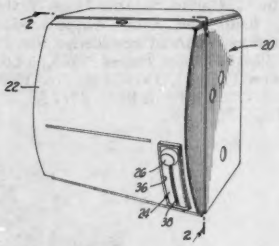
Control is obtained for the prior art practice of intermittently moving a continuously driven web by cyclically stroking such web so as to pull it by discrete amounts from a releasable supply thereof. Regulation of intermittent web advance is disclosed as being controlled in accordance with the length of web subject to such cyclical stroking.



3,606,125
LEVER ACTUATED ROLL TOWEL DISPENSER

Council A. Tucker, Glendale, and Jack L. Perrin, Los Angeles, Calif., assignors to Towlsaver, Inc., Los Angeles, Calif.

Filed Aug. 26, 1969, Ser. No. 853,226
Int. Cl. B65h *17/26*
U.S. Cl. 226—130 **44 Claims**



A reciprocal operating lever drives a rotatable member, preferably the dispensing roll of a roll towel dispenser, in a single direction of rotation during both forward and return strokes of said lever drawing a toweling continuous web from a supply roll and dispensing lengths thereof from between said dispensing roll and a pressure roll during said lever strokes. The operating lever drives the dispensing roll through ratchet controlled rack-gear assemblies alternately actionable during the lever strokes for the dispensing roll single direction rotation. A pivotal hook anti-milking means locks the dispensing roll in the event a force is applied to the toweling web being dispensed attempting to overrun the dispensing roll rotation and also when the dispensing roll is stationary. Anti-overspin means locks the dispensing roll at the end of the lever strokes preventing momentum of the dispensing roll from causing roll overspin beyond the lever movements. Also, lever stroke adjustment may be provided for selectively adjusting the lever stroke as permitted by continued drive between the lever and dispensing roll despite lever reversal in either direction of movement.

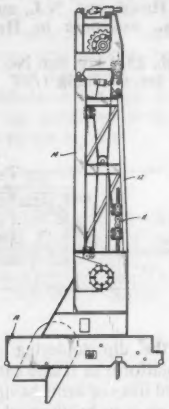
3,606,126
COMPENSATING HOSE REEL

Dale H. Pryor, Houston, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Mar. 9, 1970, Ser. No. 17,750
Int. Cl. B65h *17/34*
U.S. Cl. 226—173 **8 Claims**

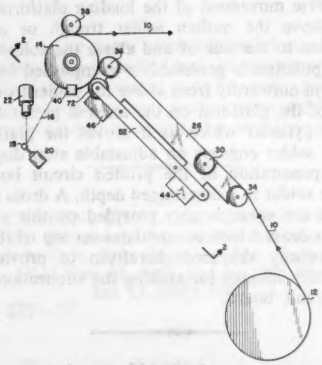
An endless chain device such as a retractor in which conduits connected to the endless chain are wound on

a pair of drums, and resilient means interconnect the drums to permit different speeds of rotation of the drums



as the connections between the conduit and endless chain move toward and away from the drum at different speeds.

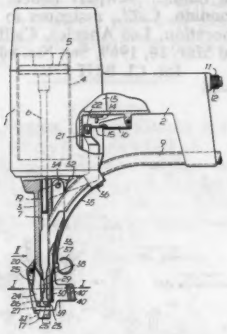
3,606,127
TRANSPORT SYSTEM
Lee Roy Brown, Houston, Tex., assignor to Image Information Inc., South Norwalk, Conn.
Filed Jan. 15, 1969, Ser. No. 791,217
Int. Cl. B65h *17/20*
U.S. Cl. 226—190 **4 Claims**



This disclosure is of a high speed data plotter system. The data plotter system uses modulated laser light to scan photographic film. The system includes means for driving the photographic film, and a pair of guide rollers with helices which frictionally engage the moving photographic film. The helices are made of a material having a high coefficient of friction relative to the coefficient of friction of the photographic film. The guide rollers help to maintain the fast moving film taut and true in position during the scanning.

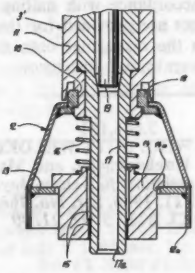
3,606,128
PERCUSSION MACHINE FOR FASTENERS
Adolf Cast, Oberlenningen, Heinz Schwarz, Zizishausen, and Kurt Reich, Nurtingen, Germany, assignors to Karl M. Reich, Maschinenfabrik, Nurtingen, Germany
Filed Mar. 5, 1968, Ser. No. 710,524
Claims priority, application Germany, Mar. 7, 1967, P 16 03 943.3
Int. Cl. B27f *7/06*
U.S. Cl. 227—1 **25 Claims**

A percussion machine for driving fastening elements such as nails, staples, or the like into workpieces which is provided with different safety means, and especially with means for preventing the percussion piston with a striker



rod thereon from carrying out a driving stroke when no fastening element is located within the guide channel of the striker rod.

3,606,129
APPARATUS FOR DRIVING ANCHORING DEVICES INTO HARD RECEIVING MATERIALS
Adolf Ritter, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed Jan. 21, 1969, Ser. No. 792,517
Claims priority, application Germany, Apr. 3, 1968, P 17 03 117.3
Int. Cl. B25c *1/18*
U.S. Cl. 227—11 **8 Claims**

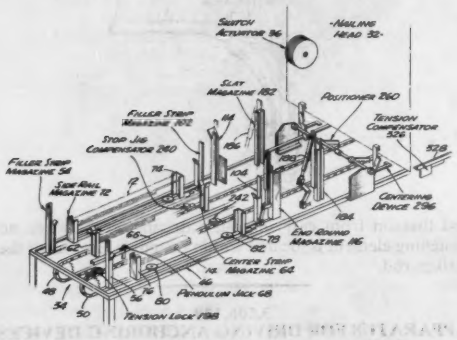


An apparatus for driving anchoring devices into hard receiving material, such as concrete, comprises positioning a mass such that it surrounds the drive-in point and supports the receiving material during the driving process. The mass is advantageously urged against the receiving material so that it will be uniformly positioned thereon to prevent the cracking or nicking of the receiving material. The apparatus for effecting this includes a setting gun having a reciprocating barrel member for driving the anchoring element into the concrete. Associated with or directly connected to the barrel is the mass. The mass surrounds the concrete at the location of the placement of the anchoring element and is advantageously provided with a central opening to permit the drive piston to movetherethrough and to drive the anchoring element into the concrete at such location. Another embodiment includes a widened flange portion surrounding the barrel and which has an internal ledge portion which supports the mass but prevents it from becoming disassociated with the barrel. The mass is mounted so that it is urged in a contacting direction toward the receiving material by a coil spring contained within the flange extension.

3,606,130
CONVEYOR CONTROLS FOR NAILING MACHINE

Roland D. De Lamar, Newport Beach, and Robert H. Herod, Escondido, Calif., assignors to De Lamar Bed Spring Corporation, Los Angeles, Calif.

Filed Mar. 20, 1969, Ser. No. 808,910
Int. Cl. B27f 7/02
U.S. Cl. 227—45 26 Claims

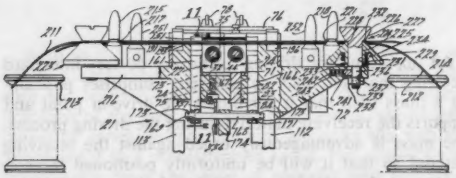


The bed frame nailing machine comprises a conveyor in association with a nailing machine. Wooden bed frame members are for the most part automatically discharged onto and positioned upon the conveyor. They are locked together in unitary structure as the nailing machine accomplishes securement. Some of the bed frame parts are discharged onto the conveyor and locked on the conveyor in accordance with signals from conveyor position. Others are discharged in accordance with nailing machine programming. Magazines are provided for the various parts and discharge from the magazines onto the conveyor is accomplished by several novel structures.

3,606,131
FINE WIRE BUTT WELDER

Walter J. Rozmus, Hubbardsville, and Matt T. Rozmus, Barneveld, N.Y., assignors to Kelsey-Hayes Company

Filed Oct. 11, 1968, Ser. No. 766,813
Int. Cl. B23k 3/02, 21/00
U.S. Cl. 228—3 38 Claims

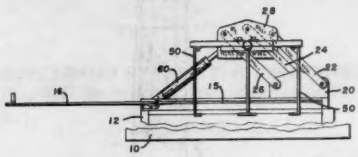


A fine wire welding machine for cold butt welding small diameter wires through a multiple upset technique. The machine includes a loading mechanism for accurately positioning the fine wire strands for subsequent engagement with the welding dies and the welding dies are movable in a plane parallel to their abutting faces for shearing the wires and aligning the end of the wire from one spool with the end of the wire from another spool for the subsequent welding technique. An improved operating mechanism is incorporated for operating the die actuating V-blocks and for operating the dies and gripping means in a predetermined sequence. The operating mechanism includes means for adjusting the opening of the dies and for permitting retraction of the dies for the loading procedure.

3,606,132
SOLDERING APPARATUS FOR PRINTED CIRCUIT BOARDS

Ralph A. Rinaldi, Hawthorne, N.J., and William Tippy, Philadelphia, Pa., assignors to Henry Mann, Inc., Feasterville, Pa.

Filed Feb. 25, 1970, Ser. No. 13,888
Int. Cl. B23k 1/08
U.S. Cl. 228—36 15 Claims

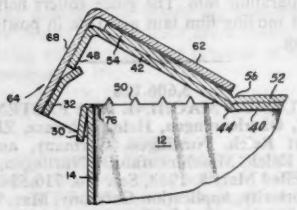


Apparatus for the dip soldering of printed circuit boards includes a platform or frame carried on a plurality of pivotally mounted links or arms having their lower ends carried by the base so as to be disposed in a parallelogram array. With the platform moved to an up condition, a printed circuit board is removably gripped in spring fingers adjustably carried by the platform. In this up condition the gripped printed circuit board is above and parallel to the surface of a body of molten solder in a heated container. To solder the circuit of the board, the platform and gripper board is swung on the links toward the molten solder until the under surface of the board just enters the molten solder to a shallow determined depth. The loading platform is carried on rods disposed to permit the transverse movement of the loading platform from a position above the molten solder trough or container to a position to the side of and above the solder trough. This manipulation is preferably accomplished by pulling the platform outwardly from above the solder trough. The swinging of the platform on the arms is preferably by a pneumatic cylinder which as it moves the platform towards the solder engages an adjustable stop disposed to limit the penetration of the printed circuit board into the molten solder to a determined depth. A dross skimmer as part of the cover is also provided on this apparatus so that the dross which accumulates on top of the solder may be readily skimmed therefrom to provide clean molten solder adapted for making the connections on the printed circuit board.

3,606,133
RECLOSABLE CARTON CONSTRUCTION

George LeRoy Meyers, Neenah, Wis., assignor to American Can Company, New York, N.Y.

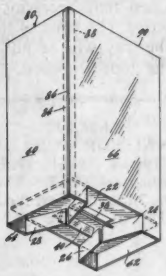
Filed Sept. 22, 1969, Ser. No. 859,692
Int. Cl. B65d 5/54
U.S. Cl. 229—7R 10 Claims



A reclosable carton construction wherein an auxiliary blank is secured to and reinforces an upper corner construction of the carton formed from a main blank. An

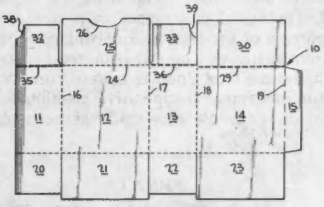
end panel of the main blank is provided with a rupturable flap which has a removable portion secured to the auxiliary blank with the latter pivoting about a pair of superposed hinge lines in the top panels of the main blank. In one form of the invention the reclosable corner construction tears along parallel hinge lines between the top panels and front and rear panels of the main blank whereas in a modification the tear lines are located inwardly along the top panels so as to provide a pair of dust flaps after the carton is open.

3,606,134
FOLDED WASTE PAPER CONTAINER
William H. Engle, 10 Hillvale Road, Syosset, N.Y. 11791
Filed Jan. 15, 1969, Ser. No. 791,282
Int. Cl. B65d *5/32*
U.S. Cl. 229—23 **1 Claim**



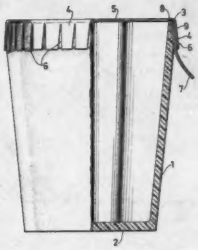
A folded waste paper container which is stamped in two sections from a single blank of corrugated material and so die cut and so scored as to be readily foldable into a rectangular cross-sectional configuration and interlocked to thereby provide a receptacle for waste paper and the like.

3,606,135
CARTONS CONTAINING COUPONS
Charles W. Rosenburg, Jr., North Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Buffalo, N.Y.
Filed Nov. 21, 1969, Ser. No. 878,853
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 **4 Claims**



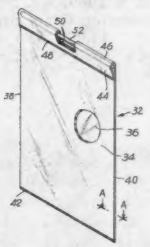
The carton, so far as its general basic structure is concerned comprises the usual four wall panels secured in parallelepiped form by means of a glue-panel extending from an end panel and adapted to be secured to the remote edge of the opposite end panel. At each end of the carton each of the four main wall panels is provided with a closure flap, the flaps extending from the broader front and rear face walls preferably being of substantially the depth of the carton itself, while the flaps extending from the narrow side walls are adapted to extend only approximately half way across the width of the carton. However, the flaps extending from the upper ends of the side walls are attached to the side walls by perforated tear lines so as to be ruptured and removed when the main outer closure flap to which they are glued is raised. Furthermore, the other side wall flap is similarly detachably connected to the remaining face wall along a tear line and this last named flap constitutes the premium or promotional coupon.

3,606,136
CONTAINERS MADE FROM A FOAM PLASTIC MATERIAL
Christian Hegardt, Skivarp, Sweden, assignor to AB Tetra Pak, Lund, Sweden
Filed June 13, 1969, Ser. No. 833,062
Claims priority, application Sweden, June 27, 1968, 8,710/68
Int. Cl. B65d *41/44*
U.S. Cl. 229—43 **8 Claims**



A container comprises a container body made of foam plastic material and a cover for the same made from metal foil and which is turned down over the top edge of the container body and pleated. A leak-proof joint is established between the cover and container body by causing the foam plastic to swell to such an extent that the pleats along the folded-down edge portion of the cover are filled with foam plastic.

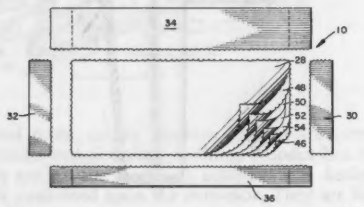
3,606,137
DOWEL HANDLE BAG
Emanuel Kugler, Lawrence, N.Y. (Kennedy House, 110—11 Queens Blvd., Forest Hills, N.Y. 11375)
Filed July 8, 1969, Ser. No. 839,865
Int. Cl. B65d *33/06*
U.S. Cl. 229—54 **1 Claim**



A construction for a plastic bag with a dowel handle made from tubular stock with welded seams on the top and bottom of the bag for holding heavy bulk materials or items. The material at the top of the bag is folded over and fastened to one face of the bag to provide a channel for a dowel; the force imparted to the bag by the dowel is transmitted substantially along the width of the bag and other than on a welded seam. A cut-out is provided in

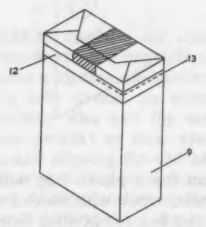
the bag and through the fold, approximately midway between the sides thereof, so that the hand of the holder may be accommodated around the dowel. Alternative constructions using side gusseted or side welded tubular stock or sheet stock for the bag are described. Means may be provided to prevent the dowel from being removed from the channel. Furthermore, in some of the embodiments it is useful to provide snaps rather than welding for the folded top of the bag.

3,606,138
ONE-PIECE ENVELOPE WITH INTEGRAL, DETACHABLE COUPONS CONTAINED THEREIN
Robert D. Allison, West Hartford, Conn., assignor to United States Envelope Company, Springfield, Mass.
Filed Aug. 21, 1969, Ser. No. 851,857
Int. Cl. B65d *27/34*
U.S. Cl. 229—70 **22 Claims**



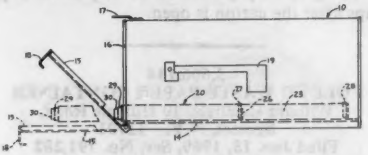
An envelope enclosing a number of coupons is made from a single blank of paper or the like, which blank also includes the coupons. A potential separation line extends along each of the four edges of the finished envelope and, by tearing or cutting along these four lines, the coupons contained within the envelope are separated from one another and from the envelope. The front and rear panels of the envelope may also include coupon portions which are separated from the remainder of the envelope and from the other coupons by tearing or cutting along the potential separation lines.

3,606,139
LAMINATED WEBS
John Rowland Arscott, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Sept. 8, 1969, Ser. No. 856,069
Claims priority, application Great Britain, Sept. 17, 1968, 44,092/68
Int. Cl. B65d *65/42, 85/10*
U.S. Cl. 229—87C **12 Claims**



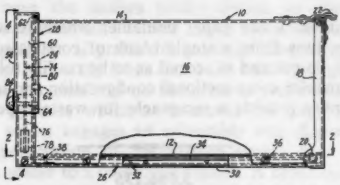
A laminated web containing a layer of wrapping film and comprising a series of blanks, each of which may be folded to form a packet—especially a cigarette packet.

3,606,140
MAIL BOX TRAY
John K. Shannahan, 114 Mike Loop, Jacksonville, N.C. 28540
Filed Sept. 17, 1969, Ser. No. 858,584
Int. Cl. A47g *29/12*
U.S. Cl. 232—17 **3 Claims**



In abstract, a preferred embodiment of this invention is an open, partitioned mail receiving tray for insertion in rural type mail boxes. The front of the tray is fitted with a magnet so that the tray will be pulled partially out of the box whenever the door is opened.

3,606,141
VISUAL SIGNAL FOR RURAL MAILBOXES
Floyd R. Taylor, 3346½ Walnut Ave., Carmichael, Calif. 95608
Filed Apr. 24, 1969, Ser. No. 818,942
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **7 Claims**



A conventional rural mailbox is provided therebeneath with a casing through which projects a rod engageable at its forward end with the mailbox door and at its rear end with a visual signal, biased to operative position and held in inoperative position by the adjacent end of the rod. The signal is arranged in a casing, at least the upper portion of the rear wall of which is glass or other transparent material. The rod is biased to move forwardly when the mailbox door is opened, thus releasing the signal for movement to operative position to advise the occupant of the house that mail has been placed in the box.

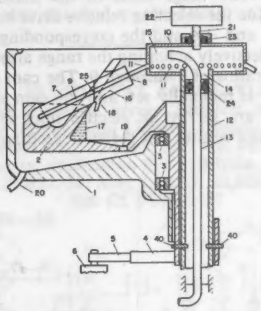
ERRATA

For Classes 232—43.2 and 232—62 see:
Patent Nos. 3,606,144 and 3,606,145

3,606,142
CENTRIFUGAL APPARATUS
Johan Eric Hayden Westberg, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden
Filed July 9, 1969, Ser. No. 840,220
Claims priority, application Sweden, July 10, 1968, 9,474/68
Int. Cl. B01d *21/26;* **B04b** *1/20, 15/02*
U.S. Cl. 233—1A **10 Claims**

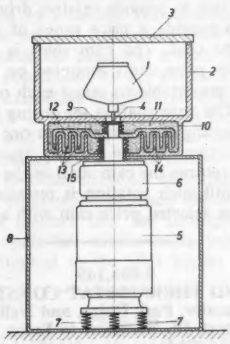
A centrifugal apparatus including a rotating support member for supporting sample containing vessels and a

distributing chamber rotatable with the support member and adapted to receive liquid for distributing the same through cannulas to the vessels. The pressure in the distributing chamber is varied periodically to vary the level



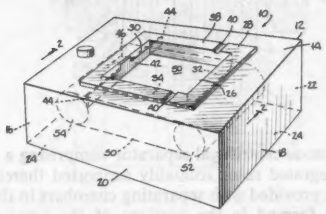
of the liquid in the vessels, and hence to agitate the said liquid in the vessels.

3,606,143
DAMPING DEVICE FOR A CENTRIFUGE ROTOR
Hans Stallmann, Osterode, Germany, assignor to Heraeus-Christ G.m.b.H., Osterode, Germany
Filed Feb. 25, 1969, Ser. No. 801,939
Claims priority, application Germany, Mar. 1, 1968, P 16 57 276.2
Int. Cl. B04b *9/00*
U.S. Cl. 233—23 **10 Claims**



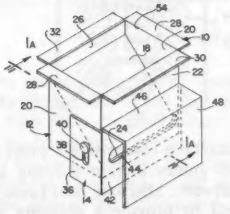
A device for damping lateral vibrations of the rotor of a high-speed centrifuge which is mounted on the upper end of a vertical drive shaft and rotatable within a chamber on the upper side of a container which, in turn, is secured to the top of a stationary frame in which the drive unit for the rotor is resiliently mounted. The container is filled with a damping fluid and contains a damping plate which is centrally secured to a hublike bushing which projects from the drive unit into the container and from which, in turn, the drive shaft projects. This damping plate is provided at least on one side with projections which, when the damping plate is moved especially by lateral vibrations, tend to displace the damping fluid within the container. These projections are preferably cylindrical, extending from the damping plate coaxially to the drive shaft toward one horizontal wall of the container. To increase the damping effect, this wall preferably also carries similar projections which extend into the gaps between the adjacent projections on the damping plate and are laterally spaced therefrom.

3,606,144
ASHTRAY
Arthur Ginsberg, Westbrook, N.Y., assignor to Royal London, Ltd., New York, N.Y.
Filed Sept. 24, 1968, Ser. No. 762,079
Int. Cl. A24f *19/08*
U.S. Cl. 232—43.2 **7 Claims**



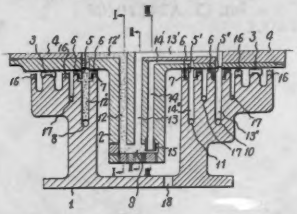
The ashtray of this invention receives refuse such as tobacco ashes and cigarette stubs in an open receptacle and removes such refuse to a collection bin in the ashtray. The refuse is deposited on a conveyor in the ashtray for delivery to and temporary storage in a collection bin. Disposal to the collection bin is controlled by an actuating device made available to the ashtray user. The collection bin is removable from the ashtray housing to provide for discarding the refuse. During the disposal operation a cleaver engages and cleans the ash receiving conveyor.

3,606,145
COIN BOX DEVICE
William J. Davidson, 23300 Beierman Ave., Warren, Mich. 48091, and John E. Montgomery, 7017 Norborne Ave., Dearborn Heights, Mich. 48127
Filed Mar. 26, 1970, Ser. No. 22,906
Int. Cl. B65g *11/04*
U.S. Cl. 232—62 **16 Claims**



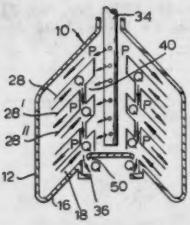
The invention pertains to a coin box device adapted to receive and pass coins therethrough into a collecting box and to prevent discharge or release of coins therefrom except by the opening of a simple door or other discharge avenue for release of collected coins. The coin box device of this invention is primarily designed to prevent theft of coins from the box. A gate is provided at the coin receiving device which allows coins to pass into the box chamber but prevents those coins from passing out of such chamber through the receiving device. This gate is disposed adjacent a wall or panel that limits rotation of coins through the gate opening, thus preventing discharge of the coins through the gate and receiving device coin slot openings even though in register with each other.

3,606,146
CENTRIFUGAL SEPARATOR
Osamu Fujii, Michio Ishigaya, and Hiroyuki Nakamoto, Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 12, 1969, Ser. No. 798,680
Claims priority, application Japan, Feb. 15, 1968, 43/9,153; June 18, 1968, 43/42,049
Int. Cl. B04b *9/06*
U.S. Cl. 233—24 **2 Claims**



A continuous centrifugal separator comprising a casing, and an integrated rotor rotatably supported therein, said rotor being provided with separating chambers in the form of hollows formed in the portions of the rotor remote from the center thereof, an opening for introducing a mixture to be treated into said separating chambers, an opening for discharging the separated light fraction, another opening for discharging the separated heavy fraction that is provided at a point radially farther from the above openings, and further provided with passages for respectively communicating said openings to the outside.

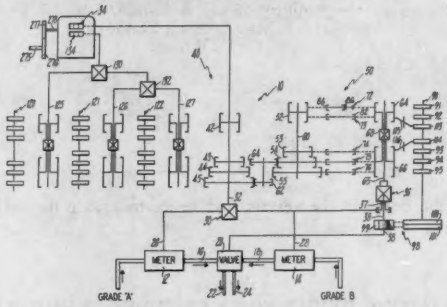
3,606,147
SEPARATOR
Frank Broadbent, Thongsbridge, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England
Filed Dec. 29, 1969, Ser. No. 888,742
Claims priority, application Great Britain, Dec. 16, 1969, 61,120/69
Int. Cl. B04b *1/00, 11/00*
U.S. Cl. 233—29 **4 Claims**



A centrifugal machine comprising a bowl or tank having a plurality of guides therein defining a number of feed paths therebetween, alternate feed paths being closed at their upper end to provide a plurality of open and closed feed paths arranged alternately, a perforated slurry infeed pipe for introducing slurry to be separated into said bowl or tank and a spilling lip and opening for allowing removal of separated liquor component from each closed feed path.

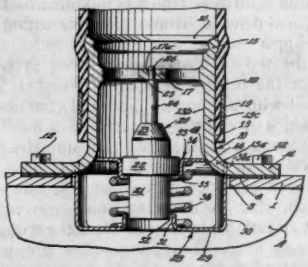
3,606,148
QUICK CHANGE VARIATOR
Christian W. Kruckeberg and Joseph D. Clymer, Fort Wayne, Ind., and Arthur J. Wells, Bloomfield, Conn., assignors to Veeder Industries Inc., Hartford, Conn.
Filed July 10, 1968, Ser. No. 743,686
Int. Cl. F16h *3/22;* **G06c** *15/00*
U.S. Cl. 235—61M **19 Claims**

Fuel dispensing apparatus having a register for registering the cost and volume of fuel dispensed and price and blend variators with range arm stacks and corresponding cam shafts for setting the blend variator for selecting the product (i.e., the blend of two separate grades of fuel and the individual grades) to be delivered and for setting the price variator for selecting the corresponding unit volume price. The range arms of the blend and price variators provide for selecting relative drive ratios of +3, −3, +4, +5, and +6 and the corresponding cam shafts provide for selectively actuating the range arms to provide relative drive ratios of 1 through 9. The cam shaft of the blend variator is manually set, and the cam shafts of the price variator are set by an electric reset motor during a combined price setting and register resetting cycle.



In the embodiment of FIG. 8 the price variator comprises a pair of conventional manually adjustable range arms and a quick change section for varying the price setting in one cent increments through a range of 18 cents. The quick change section includes a stack of range arms providing relative drive ratios of +3, −3, +4, +5, and +6; and for selectively adding or subtracting the output of the range arms, and a cam shaft for selectively actuating the range arms to provide relative drive ratios of −9 through +9 to provide a price range of 18 cents in increments of one cent. The cam shaft is adapted to be angularly set by price cams mounted on the cam shaft and which are presettable to select each of the available price settings. The cam shaft is set during the register reset cycle by rotating the cam shaft in one angular direction to a withdrawn angular position against the bias of a spring which returns the cam shaft in the opposite angular direction until such rotation is restrained by the engagement of the selected price cam with a one-way stop.

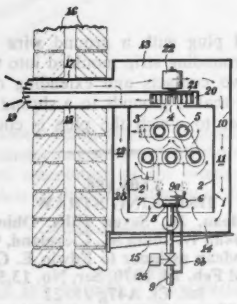
3,606,149
VALVE AND THERMOSTAT CONSTRUCTION
Frank E. Obermaier, Park Ridge, and Nello L. Benedetti, Mount Prospect, Ill., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Apr. 22, 1969, Ser. No. 818,280
Int. Cl. F01d *7/16*
U.S. Cl. 236—34 **5 Claims**



Attachment of a valve and an associated thermostat directly on an outlet fitting of an engine to control coolant

flow between the engine and a heat exchange means reduces manufacture and assembly cost by reducing the number of parts and facilitating installation. The valve seats directly against an internal surface of the fitting by means of a power unit having one end connected to an internal portion of the fitting. Likewise a thermostat guide bracket is also attached to the fitting.

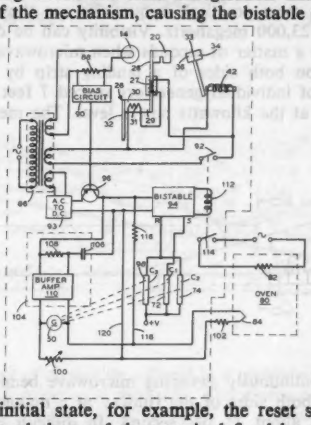
3,606,150
FLUID HEAT APPARATUS
Jozef Rosiek, Surbiton, Surrey, England, assignor to Potterton International Limited, London, England
Filed Aug. 6, 1969, Ser. No. 847,939
Claims priority, application Great Britain, Aug. 15, 1968, 39,031/68; May 2, 1969, 22,456/69
Int. Cl. F23n *1/02*
U.S. Cl. 236—20 **7 Claims**



The invention provides a gas-fired water heater comprising a burner unit including a main burner and a pilot burner, a combustion chamber and a heat-exchanger assembly sealed by a casing, two conduits for admitting combustion air to, and exhausting combustion products from, the combustion chamber, a horizontally disposed balanced flue constituted by the extremities of said conduits, and an extraction fan incorporated in the exhaust conduit to draw combustion products from the combustion chamber and to expel said combustion products to atmosphere through the exhaust conduit. Preferably the extraction fan includes electrical switching means adapted to control the combustion products extraction rate of the fan in such a manner that the throughput of the fan required for operation of the main burner is reduced when gas is supplied to the pilot burner only.

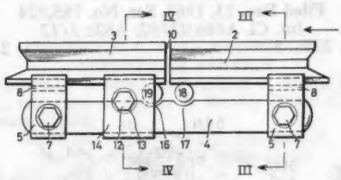
3,606,151
REGULATOR-METER UTILIZING A BEAM OF LIGHT FOR INDICATION AND REGULATION
Michel Dumast, Pantin, Guy Rouzaud, Fontenay-Aux-Roses, and Luc Thevenin, Cormeilles-en-Parisis, France, assignors to Societe d'Instrumentation Schlumberger, Paris, France
Filed July 14, 1969, Ser. No. 841,695
Claims priority, application France, July 24, 1968, 160,343
Int. Cl. G05d *23/22*
U.S. Cl. 236—69 **8 Claims**

Regulator-meter apparatus includes signal-responsive meter mechanism for projecting a light spot onto a transparent screen such that the spot traverses the screen during signal-caused movement of the mechanism. The position of the spot on the screen is detected by two photosensitive elements which define one set point for the regulator portion of the apparatus, the elements being spaced apart a distance slightly greater than the corresponding cross-sectional dimensions of the spot and having the outputs thereof connected to different ones of the set and reset inputs of a bistable multivibrator. The bistable assumes either its set or reset state depending upon the position of the spot relative to the elements. Circuitry is provided for effecting initial full-scale energization and de-energization of the mechanism, causing the bistable to assume



a known initial state, for example, the reset state. The cross-sectional shape of the spot is defined by a suitably apertured mask, mounted so as to be responsive to the displacements of both a proportional-effect and an integral-effect bimetallic element.

3,606,152
RAIL JOINT
Wilhelm Orth, 1 Affentorplatz, 6 Frankfurt am Main, Germany
Filed Feb. 17, 1969, Ser. No. 799,681
Claims priority, application Germany, Feb. 20, 1968, P 17 08 648.5
Int. Cl. E01b *11/56*
U.S. Cl. 238—215 **3 Claims**

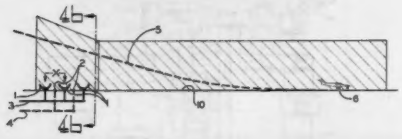


A rail joint connecting a pair of consecutive sections of rail track; the facing ends of the sections are spaced apart including a base plate disposed beneath both of the sections, a bar joint securing a portion of each of the sections remote from the facing ends to the base plate, a clamp disposed adjacent the facing ends of the section for floatingly supporting the ends of the sections and grooves and rollers disposed in the base plate directly adjacent to facing ends of the sections. When a downward force is exerted at the facing end of one of the tracks a force is transmitted to the facing end of the other track through the base plate to maintain the track sections in planar alignment.

3,606,153
METHOD FOR INCREASING VISIBILITY THROUGH FOGS
Raymond Marcel Gut Boucher, Metuchen, N.J., assignor to Wave Energy Systems, Inc., New York, N.Y.
Filed July 28, 1969, Ser. No. 845,330
Int. Cl. E01h *13/00*
U.S. Cl. 239—2 **12 Claims**

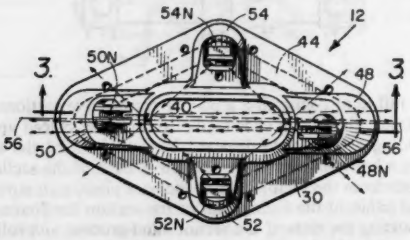
This disclosure relates to a method for increasing visibility through warm natural or artificial fogs. It is based

upon the absorption and degradation of microwave energy into heat to accelerate the evaporation of the smaller fog droplets which are the greatest hindrance to the transmission of light through fog. The method can be used within the 100 to 230,000 megahertz range, however, the most practical frequencies are those between 500 and 23,000 megahertz. Visibility can be doubled or tripled in a matter of seconds when microwave energy is emitted on both sides of a landing strip by means of a series of individual generators spaced 7 feet apart and operated at the kilowatts power level. The method com-



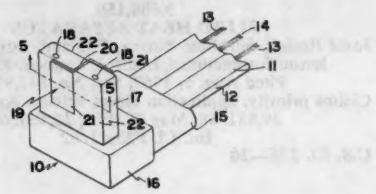
prises continuously sweeping microwave beams vertically from both sides of the runway at a maximum sweep speed of about 1° per second. In difficult cases, with denser fogs, the evaporation of droplets is increased by combining the microwave emission with ultrasonic waves from a number of airborne ultrasonic generators operating at intensities above 150 db and within the 16 to 100 kHz. range. The method can economically handle any kind of natural warm fogs and may thus allow continuous year round operation at certain airports.

3,606,154
SPRAY COATING APPARATUS
Raymond C. Tufts, Walnut Creek, Calif., assignor to Mono-Therm Insulation Systems, Inc., San Francisco, Calif.
Filed Dec. 23, 1968, Ser. No. 785,924
Int. Cl. A01n *17/02*; A62c *1/12*
U.S. Cl. 239—8 **2 Claims**



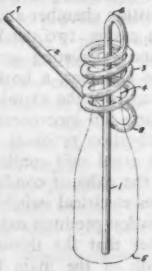
A gun having a center orifice for delivering a course of dry particulate material and plural nozzle tips adjacent the orifice. The nozzle tips are adapted to form flat fan-shaped streams of adhesive. Each of a pair of such tips is located in diametric opposition to the other and such nozzle tips are so oriented that the flat fan-shaped streams slice through the course of dry material to spread out the dry material and to coat the dry material with adhesive so that the adhesive will adhere to a surface. A pair of auxiliary nozzle tips are provided in quadrature with the tips previously mentioned and contribute to the shaping of the course of dry material and the application of adhesive to the dry material and to the surface being coated.

3,606,155
THREE WIRE ELECTRICAL PLUG
Lynne E. Windsor, Winnipeg, Manitoba, Canada, assignor to James B. Carter Limited, Winnipeg, Manitoba, Canada
Filed May 16, 1969, Ser. No. 825,208
Int. Cl. H01r *3/06*
U.S. Cl. 339—14R **5 Claims**



An electrical plug with a ground wire connected to an angulated grounding strip moulded into the plug body between the two contacts and extending on both sides of the body so that it grounds to a shroud shielding the pins of a heater to which the plug is connected.

3,606,156
DRINKING STRAW
John Homorodean, Jr., Seven Hills, Ohio, and Edwin E. Gentilly, 4488 W. 160th St., Cleveland, Ohio 44135; said Homorodean assignor to Edwin E. Gentilly
Filed Feb. 24, 1970, Ser. No. 13,561
Int. Cl. A47g *19/22*
U.S. Cl. 239—33 **4 Claims**

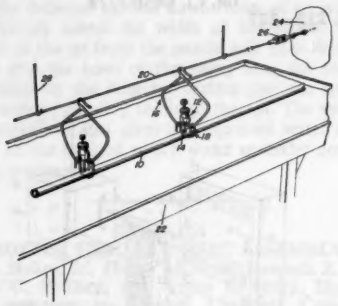


A tube for drinking liquids from a container has end portions which connect with upper and lower ends of a spirally shaped mid portion. Said end portions, or when said end portions are not coplanar as preferred, intersections of planes of the end portions define an angle which is greater than 90 degrees but less than 180 degrees. The turns of the mid portion surround and extend downwardly from the top of the end portion adapted to be placed into the container. Said turns are also adapted to envelop the upstanding walls of the container to hold the straw in a stable position so that siphoning action does not occur.

3,606,157
SUSPENSION SPRAY SYSTEM
Richard D. Chapin, 368 N. Colorado Ave., Watertown, N.Y. 13601
Filed Aug. 4, 1969, Ser. No. 847,210
Int. Cl. B05b *15/02*
U.S. Cl. 239—118 **12 Claims**

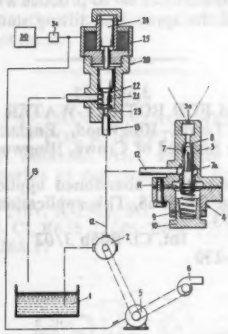
A watering system for long runs consisting of an elongated water supplying main suspended horizontally in an elevated position from a tensioned suspension cable by

means of a series of hangers engaged with the suspension cable and movement accommodating supports engaged between the main and the hangers. The main is provided with a series of upstanding spray nozzles connected thereto by flow restricting small diameter connecting or supply



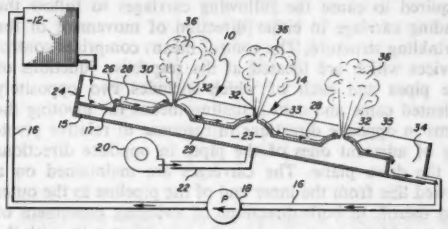
tubes, each nozzle being directly engaged with and supported by a hanger independently of the main whereby a proper vertical orientation of the nozzles will be maintained regardless of slight movements in the main itself.

3,606,158
PRESSURE JET BURNER CONTROL SYSTEMS
Edward Pritchard, 339 Balaclava Road, Caulfield, Victoria, Australia
Filed Nov. 13, 1969, Ser. No. 876,432
Claims priority, application Australia, Nov. 15, 1968, 46,350/68
Int. Cl. B04b *9/00*; **F02g** *3/00*; **F04b** *9/00*
U.S. Cl. 239—124 **5 Claims**



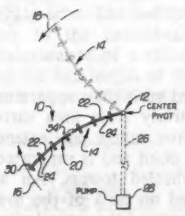
The invention relates to pressure jet burner control systems including a motor driven fuel pump which stops and starts according to the fuel requirements of the burner and in which cut-off and start-up of the fuel spray in the burner is abrupt and the pressure of fuel is maintained above a predetermined minimum pressure of the volume. Fuel supply to the burner is controlled by a quick cut-off valve arranged to start and cut off fuel at predetermined fuel pressure and also includes a by-pass line connected in the fuel line between the cut-off valve and the pump, said bypass line being controlled by a solenoid valve which simultaneously relieves fuel trapped in said fuel line under pressure when the fuel pump is deenergised.

3,606,159
MULTI-SPRAY DEVICE
George P. Sutton, Encino, Calif., assignor to North American Rockwell Corporation
Filed July 7, 1969, Ser. No. 839,270
Int. Cl. B05b *7/08*
U.S. Cl. 239—127 **10 Claims**



A method of dispersing a liquid in a multiplicity of fine mist spaced patterns is disclosed. The device consists of an inclined trough having a series of substantially inclined bulbous protrusions over which liquid is directed. An orifice is located at the apex of each protrusion through which fluid under pressure passes. A blast of gaseous fluid, for example air, is directed through the apertures thereby atomizing the film of liquid passing over the holes. By inclining the trough, liquid not dispersed by the uppermost bulbous protrusion is collected and directed by means of contoured channels to the next dome under gravity for subsequent atomization thereby. The unused liquid is then collected and circulated back to the liquid supply tank and thence into a weir at the top of the trough, thus completing the cycle. The device therefore provides a multiple spray atomizing unit from one source of liquid supply.

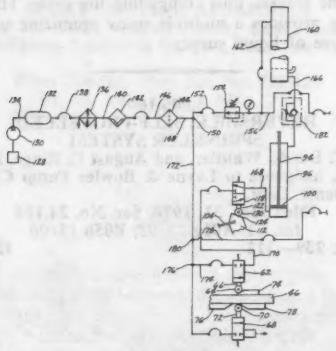
3,606,160
REVERSIBLE, SELF-PROPELLED SPRINKLER SYSTEM
Harry C. Bonds, Whittier, and August C. Ringe, Pomona, Calif., assignors to Layne & Bowler Pump Company, La Puente, Calif.
Filed Mar. 31, 1970, Ser. No. 24,113
Int. Cl. A01g *25/02*; **B05b** *15/06*
U.S. Cl. 239—212 **13 Claims**



A sprinkler-type irrigation system including an elongated, self-propelled, reversible, sprinkling apparatus or structure bidirectionally moveable along an arcuate sprinkling path. The sprinkling structure comprises an elongated, sprinkler-equipped pipeline composed of a plurality of substantially aligned, interconnected pipes relatively pivotable in a generally horizontal drive plane. The sprinkling apparatus is propelled along its path by a reversible propelling means comprising a leading carriage

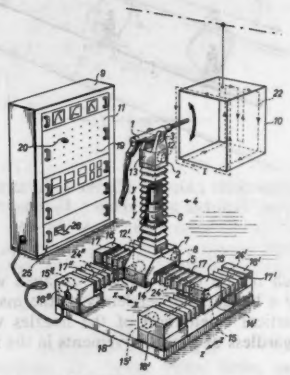
supporting the outer end of the pipeline and driven by a reversible leading motor, and comprising a plurality of following carriages respectively supporting the pipeline at the junctions of the pipes and respectively driven by reversible following motors. A reversing means reverses the carriage drive motors upon arrival of the sprinkling structure at the end of its arcuate sprinkling path. A control means responsive to relative pivoting of the pipes in the drive plane selectively energizes the following motors as required to cause the following carriages to follow the leading carriage in either direction of movement of the sprinkling structure. The control means comprises control devices which are located at the respective junctions of the pipes and each of which includes two oppositely oriented cams and cam actuating means for pivoting the cams in opposite directions in response to relative pivoting of adjacent ones of the pipes in opposite directions in the drive plane. The carriages are maintained on a bowed line from the inner end of the pipeline to the outer end therof, in both directions of swinging movement of the sprinkling structure along the sprinkling path, with the intermediate carriages progressively farther ahead circumferentially than carriages adjacent the ends of the pipeline, whereby the pipeline operates in a bow with its convex side leading.

3,606,161
SELF-PROPELLED SPRINKLING APPARATUS AND SAFETY MEANS THEREFOR
Dwaine Paul, Amarillo, Tex., assignor to Kroy Metal Products Co., York, Nebr.
Filed Apr. 10, 1969, Ser. No. 815,106
Int. Cl. B05b *3/16*
U.S. Cl. 239—177 **2 Claims**



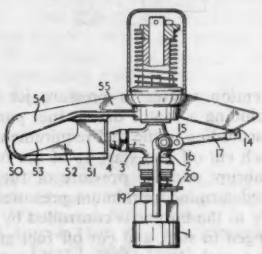
A self-propelled sprinkling apparatus for sprinkling or irrigating a relatively large area surrounding a central pivot point. A water supply pipe extends outwardly from the central pivot point and is supported by a plurality of spaced apart, wheeled towers. An air operated drive means is provided on each of the towers to propel the towers and pipe around the central pivot point. A control means is provided on each of the towers and is interconnected with each of the other towers to selectively operate the drive means associated therewith to maintain the pipe and towers in an aligned condition as the water supply pipe is pivoted around the central pivot point. A safety valve is provided in the air circuit on each of the towers to de-activate the drive means on all of the towers upon one of the towers becoming out of alignment with the other towers to prevent structural damage to the apparatus.

3,606,162
PROGRAMMED MEANS FOR IMPARTING COMPOUND MOTION TO A SPRAY GUN
Ernst Lehmann, St. Gall, Switzerland, assignor to Gema AG Apparatebau, St. Gall, Switzerland
Filed Aug. 28, 1969, Ser. No. 853,911
Claims priority, application Germany, Oct. 25, 1968, P 18 05 145.1
Int. Cl. B05b *3/18*
U.S. Cl. 239—227 **3 Claims**



Spraying apparatus for automatically coating workpieces with coating material applied by means of a spray gun the apparatus including a carrier head on which a spray gun is mounted for pivoting movement in a vertical plane. The carrier head is mounted on a lifting stand for vertical up and down movement and the lifting stand is placed on carriage means for movement in a horizontal plane in two directions at right angles to each other. The movements of the spray gun, lifting stand and carriage means are effected by motors controlled by program control devices adapted to be set to produce a sequence of operating steps of the spray gun, lifting stand and carriage means.

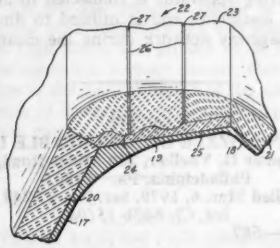
3,606,163
SWING ARM FOR ROTARY WATER SPRINKLER
Brian Alfred Lewis, Ringwood, England, assignor to Wright Rain Limited of Crowe, Ringwood, Hampshire, England
Continuation-in-part of abandoned application Ser. No. 739,437, June 24, 1968. This application Jan. 12, 1970, Ser. No. 2,173
Int. Cl. B05b *3/02*
U.S. Cl. 239—230 **4 Claims**



A swing arm for a rotary water sprinkler. The swing arm has a spoon-like portion into which a jet of water from a nozzle of the sprinkler impinges. The sprinkler

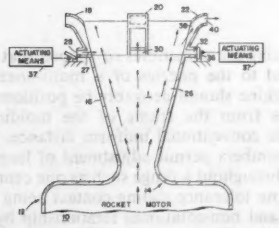
may be of the kind having a sectoring mechanism operative to cause the swing arm to effect oscillation of the sprinkler through a limited sector. To reduce the impact of the swing arm on a stop at the end of the sectoring operation, the spoon-like portion has a deflector surface extending along the length of the spoon from the end nearer to the nozzle and an aperture extending longitudinally of the bowl of the spoon-like portion along a major part of the deflector surface downstream of an initial part which extends across the width of the spoon, whereby only part of the jet from the nozzle will flow through the aperture into the bowl of the swing arm, the remainder being guided by the deflector surface past the spoon-like portion without entering the bowl thereof. The swing arm of this invention also gives an improved water distribution and so can be used with a water sprinkler not having sectoring mechanism.

3,606,164
NOZZLE THROAT INSERT ASSEMBLY
Cecil G. Stokes, Jr., Denny M. West, Kenneth E. Junior, James C. Machen, and Walter E. Sharp, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.
Filed Oct. 23, 1969, Ser. No. 868,735
Int. Cl. B64d *33/04*
U.S. Cl. 239—265.15 **3 Claims**



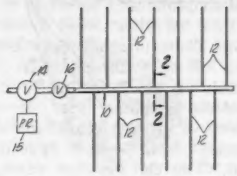
A throat insert assembly for the nozzle of a solid propellant rocket motor having incorporated therein a sine-wave configuration for preventing displacement of the throat insert from the nozzle during the tailoff of the solid propellant rocket motor.

3,606,165
JET REACTION CONTROL SYSTEM FOR ROCKETS
J. C. Dunaway, Falkville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed Nov. 6, 1969, Ser. No. 874,607
Int. Cl. B63h *25/46;* **B64c** *15/10*
U.S. Cl. 239—265.17 **7 Claims**



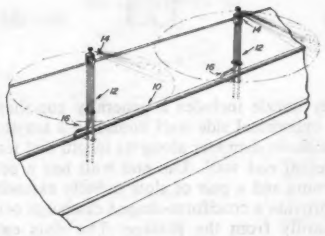
A jet reaction attitude control system for rockets wherein high velocity gases are bled from points in the divergent cone of a supersonic rocket nozzle and selectively directed through ducts to exit the nozzle normal to the centerline thereof to provide a control force on the rocket.

3,606,166
AUTOMATIC FIRE EXTINGUISHING SYSTEM
Alfred L. Whear, P.O. Box 366, Minden, Nev. 89423
Original application July 21, 1967, Ser. No. 655,152, now Patent No. 3,512,363, dated May 19, 1970. Divided and this application Mar. 30, 1970, Ser. No. 23,847
Int. Cl. A62c *35/32*
U.S. Cl. 239—272 **2 Claims**



Water flow under pressure through a distribution tube in a given axial direction is discharged as a mist into the atmosphere through relatively small bores in the wall of the tube with the bores directed contrary to the axial direction at an angle of 6° to 14° from the axis of the tube. A thermostat to detect a fire controls the supply of pressurized water to the distribution tube.

3,606,167
SPRAY SYSTEM
Richard D. Chapin, P.O. Box 298, Watertown, N.Y. 13601
Filed June 11, 1969, Ser. No. 832,145
Int. Cl. B05b *15/02*
U.S. Cl. 239—276 **5 Claims**

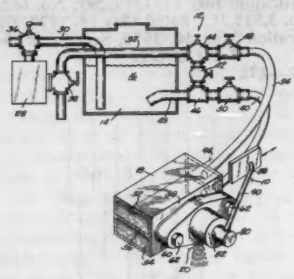


A watering system for long runs consisting of a series of elevated nozzles, each mounted on a twin rod upright and communicated with an enlarged main through a reduced diameter supply tube. The individual supply tubes meter the pressure to the individual nozzles, thereby enabling the maintenance of a substantially constant high pressure along the full length of the main. Each of the nozzles includes a manual cut-off directly therein.

3,606,168
RECIRCULATING SPRAY NOZZLE
Harry J. Seaman, Jr., Milwaukee, Wis., assignor to Seaman Corporation, Milwaukee, Wis.
Filed Dec. 27, 1968, Ser. No. 787,329
Int. Cl. B05b *1/00*
U.S. Cl. 239—597 **6 Claims**

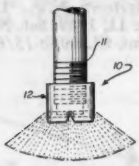
A spraying apparatus for heated bituminous material including a spray bar divided by a horizontally disposed partition into inlet and outlet flow passages and a number of spray valves mounted on the spray bar, each spray valve having an inlet port connected to the inlet flow passage in the spray bar, an outlet port connected to the

outlet flow passage in the spray bar and a spray port open to the atmosphere and a valve plug having a flow passage terminating in a spray nozzle port, the valve plug being



mounted for rotary motion in said valve to selectively connect the flow passage to the inlet port and to either the outlet port or the spray port.

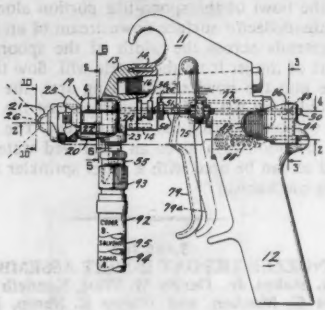
3,606,169
WIDE ANGLE SPRAY NOZZLE
Frank W. West, Newington, Conn., assignor to Casco Products Corporation, Bridgeport, Conn.
Filed Aug. 21, 1969, Ser. No. 851,803
Int. Cl. B05b *1/10*
U.S. Cl. 239—597 **3 Claims**



A spray nozzle includes a generally cup-shaped body having a cylindrical side wall bounding a lengthwise passage of uniform diameter along its length and terminating in an integral end wall. The end wall has a central circular opening and a pair of slots radially extending therefrom to provide a cruciform-shaped discharge orifice leading outwardly from the passage. The slots extend into the cylindrical side wall to provide side discharge exit paths from the passage. A protective blow-off cap is seated on the nozzle end.

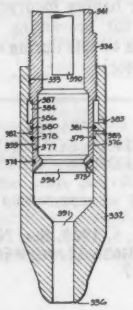
3,606,170
PLURAL COMPONENT SPRAY GUN
Thomas Oren Hoffman and Erhard Kock, Toledo, John H. Mang, Oregon, and Earl F. Staifer, Toledo, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Feb. 9, 1970, Ser. No. 9,506
Int. Cl. B05b *7/12*
U.S. Cl. 239—414 **14 Claims**

The present invention relates to a plural component spray gun which is utilized, for example, in the spraying of plastic foams. Pressurized fluid components flow through the spray gun where they are mixed together and discharged through a spray nozzle. The spray gun includes a spray head mounted on a spray gun body. The spray head defines a plurality of valve chambers which are located on longitudinally extending and parallel major axes. A valve assembly is positioned in each of the valve chambers and each of the valve assemblies includes a fluid discharge opening. A nozzle assembly, which includes a mixing plate is removably mounted on the front end of the spray head. The mixing plate is closely adjacent the discharge ends of the valve assemblies. The mixing plate defines a passageway network which is in communication with each of the fluid discharge openings. The



plural components are fed through the passageway network upon the operation of a triggering apparatus. A second triggering apparatus is connected to another one of the valve assemblies and is utilized to direct solvent into the passageway network during the cleaning of the spray gun.

3,606,171
INJECTION NOZZLE OF ADJUSTABLE LENGTH
Walter D. Voelker, 220 Miller Road, Philadelphia, Pa. 11801
Filed Mar. 6, 1970, Ser. No. 17,247
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 **2 Claims**

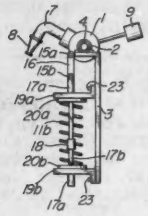


Giant articles are sometimes so shaped that the orifices to be secured to the nozzles of a multi-nozzle injection molding machine should desirably be positioned at different distances from the frame of the molding machine instead of the conventional uniform distance. Threadable adjustable members permit adjustment of length of injection nozzle throughout a range such as one centimeter with a zone of close tolerance sliding contact being locked into non-leaking and non-rotational relationship by the action of relatively high plastic pressure. Such pressure influenced zone, a plurality of O-rings, and weep holes prevent any plastic from seeping to the adjustable threads. Further adjustability is attainable by optionally using extension members which can be inserted and secured by couplers for lengthening a nozzle.

3,606,172
DEVICE FOR HOT-LINE WASHING OF INSULATORS

Kazuyuki Sato and Kenji Kawai, Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 28, 1969, Ser. No. 853,846
Claims priority, application Japan, Sept. 14, 1968, 43/66,307
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 11 Claims

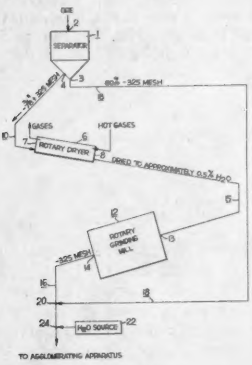


A device for hot-line washing of insulators in which a rotary drum which is rotated by the reaction force of the jet ejected through a nozzle is associated with a spring which may counterbalance the reaction force, thereby controlling the direction of the nozzle by the variation of the pressure of the jet. The device is simple in construction and inexpensive to manufacture and can wash the insulators located high above the ground or at such a place which is not accessible without danger, thus eliminating the faults due to the contamination of the surfaces of the insulators such as flashovers, corona discharges, obstacles to radio waves, etc.

3,606,173
DRY GRINDING SYSTEM FOR PREPARING IRON ORE FOR AN AGGLOMERATING PROCESS

Chester A. Rowland, Jr., Shorewood, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 6, 1969, Ser. No. 874,459
Int. Cl. B02c *21/00*
U.S. Cl. 241—17 10 Claims

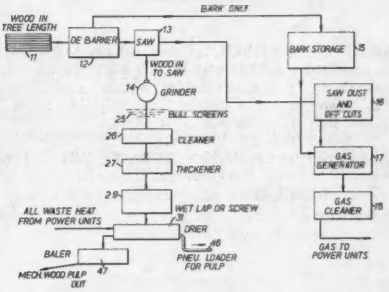


A dry grinding system is disclosed for preparing iron ore for a process in which the ore is formed into water-bound agglomerates and then dried and heat hardened to provide agglomerates with sufficient degradation resistance to withstand handling and shipment. The system includes a separator for receiving about minus ⅜ inch iron ore particles which may be at ambient temperature and dividing it into a fraction containing fines and dust of about minus 325 mesh and a fraction of plus 325 mesh and minus ⅜ inch material. The system also includes a rotary dryer and conveying means that deliver the plus 325 mesh-minus ⅜ inch fraction of material from the separator to the dryer where such material is dried to a moisture content of about 0.5%. A dry operating grinding mill is provided and a second conveying means delivers the ore from the dryer to the mill where such material is reduced to about minus 325 mesh and discharged into a third conveying means for delivery to agglomerating apparatus. A fourth conveying means is connected to separator to receive the dust and fines fraction and bypass the dryer and mill, and discharge such material into the third conveying means to mix with and cool the discharge from the mill to reduce a tendency of the mill discharge to steam and evaporate water therefrom when water is added thereto for making the water-bound agglomerates. The second conveying means may include in series flow relation a second separator followed by a concentrator with the concentrator separating iron values from tailings which are discharged from the second conveying means. The second separator removes dust and fines generated in the dryer and has an outlet for such material connected to a fifth conveying means, discharging such fines and dust from the second separator directly into the fourth and mill bypassing conveying means for later remixing in the third conveying means with concentrate discharged from the mill.

3,606,174
TIMBER PULPING METHOD

William A. C. Theed, Wargrave, England, assignor to International Pulp Holdings Limited

Filed Nov. 30, 1967, Ser. No. 686,881
Claims priority, application Great Britain, Dec. 9, 1966, 55,249/66
Int. Cl. B02c *21/02*
U.S. Cl. 241—18 6 Claims



A method for pulping timber in the woodlands to save the cost of transporting felled timber to a pulping mill. Portable equipment can be transported to the site on a member of trailers or low loaders and these can produce dried pulp for delivery direct to the users. The great heat used in pulping the timber and in cooling the engine driving the pulper can be used for drying the pulp.

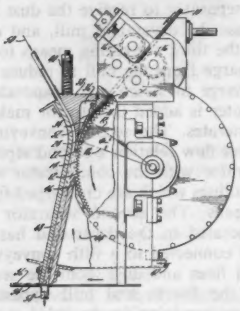
3,606,175
PICKER FOR DIVELLICATING PULP

David W. Appel and Charles L. Sanford, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 4, 1969, Ser. No. 882,258
Int. Cl. B02c *4/08*
U.S. Cl. 241—18 11 Claims

An apparatus for divellicating sheets into their component fibers, and a method therefore, includes a cylin-

drical drum having picking teeth on the surface thereof and a pulp sheet feed guide which is adapted to contact the top surface of the outermost pulp sheet so that at each point of contact between a pulp sheet and the picker teeth the angle between the plane tangent to the teeth at the point of contact and the plane of the pulp sheet at the contact point is not in excess of about 10°. This can be achieved by the use of a forming guide, the inner surface of which spirally approaches the picking teeth to a point of approximately zero clearance, the radial distance, R, from any point on the inner surface of the

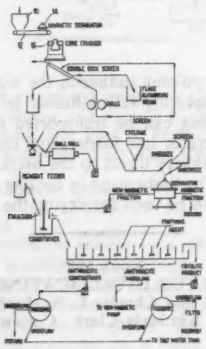


guide to the center axis of the drum being determined according to the following formula:

$$R=R_o(1+K\theta)$$

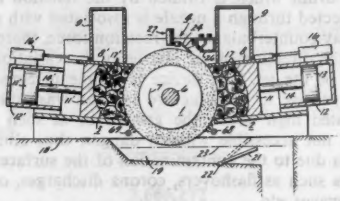
wherein R_o is the radial distance from the inner guide surface to the center axis of the drum at the point of approximately zero clearance, θ is the angle in radians between the lines corresponding to R_o and the line corresponding to R, and K is a constant which is greater than zero and less than 0.176.

3,606,176
SEPARATION OF REDUCTION BATH MATERIALS FROM CARBONACEOUS RESIDUES
Peter Anthony Vodic, Brighton, South Australia, Australia, assignor to Comalco Aluminium (Bell Bay) Limited, Bell Bay, Tasmania, Australia
Filed June 27, 1969, Ser. No. 837,017
Claims priority, application Australia, July 1, 1968, 39,959/68
Int. Cl. B02c *1/00, 11/08, 21/00*
U.S. Cl. 241—20 **5 Claims**



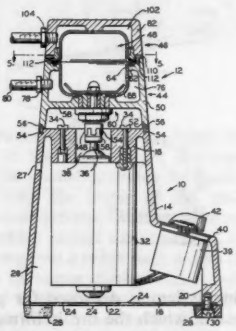
The invention relates to the recovery of reuseable constituents from the spent cathodes from electrolytic furnaces used in the reduction of aluminum, which furnaces require to be shut down from time to time for maintenance or other purposes, at which stage they contain a spent cathode consisting of carbonaceous residues from the anode, metallic aluminum and cryolite. The constituents are recovered by crushing the spent cathode to reduce particle size and to form aluminum particles into flake aluminum; screening to remove flake aluminum and to separate the larger and smaller particles of the remaining constituents; putting the particulate material through a ball mill in the form a slurry with salt water to prevent undue leaching; and separating the constituents of the ground particulate material by flotation.

3,606,177
WOOD PULP GRINDER
Donald K. Alexander, Fort William, Ontario, and John J. Denovan, Brantford, Ontario, Canada, assignors to Koehring-Waterous, Ltd., Brantford, Ontario, Canada
Filed Mar. 20, 1969, Ser. No. 808,891
Claims priority, application Canada, Apr. 11, 1968, 17,371
Int. Cl. B02c *4/00, 19/12, 23/02*
U.S. Cl. 241—42 **9 Claims**



A top stock removal device for a pulpwood grinding machine is mounted over the grind stone in the space between an uprunning pocket and a downrunning pocket and comprises a doctor blade which is included toward the uprunning pocket, showering nozzles for the blade, and a flume for diverting stock from the doctor blade over the axially opposite ends of the grind stone.

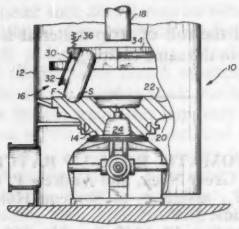
3,606,178
GRINDING MILL
Edward M. Klopp, Medina, Ohio, assignor to The Chemical Rubber Company, Cleveland, Ohio
Filed Feb. 26, 1970, Ser. No. 14,559
Int. Cl. B02c *18/12, 23/00*
U.S. Cl. 241—65 **6 Claims**



A grinding mill apparatus particularly suited for grinding small laboratory samples and the like. The disclosed embodiment includes a base support and motor housing

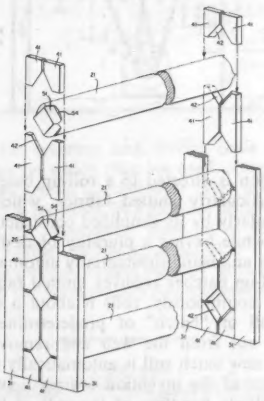
with a grinding chamber forming assembly removably mounted thereon. The grinding chamber assembly is comprised of two separable sections each defining approximately half of the chamber. Each section has an internal space for permitting a heat exchange fluid to be circulated therethrough. Additionally, a grinding blade assembly is removably mounted in one of the sections.

3,606,179
PULVERIZER
Chester J. Romanowski, Carteret, N.J., Guy A. Leclair, Mountaintop, Pa., and Harry H. Pratt, West Orange, N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.
Filed Oct. 21, 1969, Ser. No. 868,006
Int. Cl. B02c *15/00;* **F16h** *13/00*
U.S. Cl. 241—103 **8 Claims**



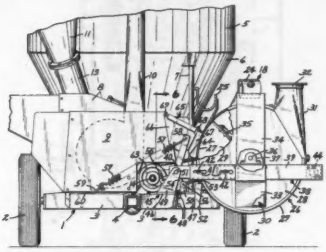
Apparatus is provided for pulverizing raw coal feed stock into comminuted particles which can be conveyed to the combustion chamber of a furnace. An abrasive overlay is deposited on the thrust ring of the pulverizer to prevent skidding of the rollers.

3,606,180
BREAKER BAR MOUNTING FOR ROTARY IMPACTOR
William F. Hahn, Devon, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.
Filed Nov. 26, 1969, Ser. No. 879,983
Int. Cl. B02c *13/26*
U.S. Cl. 241—285R **14 Claims**



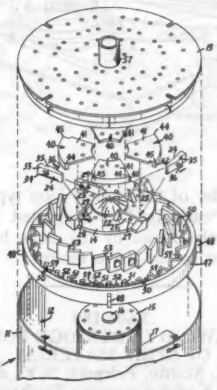
Breaker bars in a rotary impactor are tapered or otherwise shaped at their ends and supported thereat by a wedge-bar assembly located within the frame or housing of the impactor. The ends of the breaker bars do not project through the walls of the housing and there are no exterior supporting brackets and clamps for the wedge bars. The wedge-bar assembly is readily adjustable, and may be readily disassembled to allow removal of one or more of the breaker bars for maintenance and/or replacement.

3,606,181
BLOWER ATTACHMENT FOR PORTABLE FEED MILL
Carroll E. Moore, Minneapolis, Minn., assignor to Farmhand, Inc., Hopkins, Minn.
Filed Mar. 24, 1969, Ser. No. 809,693
Int. Cl. B02c *11/00;* **B65g** *53/40*
U.S. Cl. 241—60 **4 Claims**



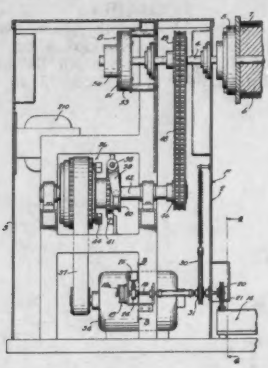
A blower carrying frame pivotally connected to a bracket for mounting on a portable feed mill of the type including a feed mixing tank, mixing mechanism connected to a drive shaft, and a discharge conveyor driven from the drive shaft. The blower has an inlet for reception of material from the conveyor, and an outlet, and is movable between inoperative storage and operative positions relative to the mixer and bracket. The blower is operatively coupled to said mixer drive shaft.

3,606,182
CRUSHING CHAMBER FOR A CENTRIFUGAL IMPACT ROCK CRUSHING MACHINE
Donald R. Warren, Spokane, Wash., assignor to Cimco, Inc., Spokane, Wash.
Filed Feb. 27, 1969, Ser. No. 803,001
Int. Cl. B02c *13/18, 13/28, 19/00*
U.S. Cl. 241—275 **7 Claims**



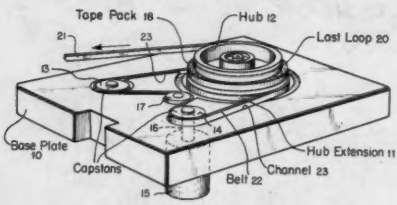
A crushing chamber for a centrifugal impact rock crushing machine is described, having a rotatable turntable for accelerating the rock to high velocities and then discharging the rock against independent wear resistant impact blocks circumscribing the turntable.

3,606,183
COIL WINDING APPARATUS
Anton F. Turk, New Berlin, Wis., assignor to Steel Fabricating Inc., Elm Grove, Wis.
Filed Mar. 17, 1969, Ser. No. 807,597
Int. Cl. H01f *41/06;* **B65h** *81/06*
U.S. Cl. 242—7.07 **9 Claims**



Flexible material is wound onto a form driven by electric motor operated transmission. To maintain constant tension on the material being wound, a brake prevents or regulates rotation of the winding form. A torque sensing circuit is connected to the brake to positively hold the form and prevent its rotation in an unwinding direction until the driving torque of the transmission reaches a predetermined value.

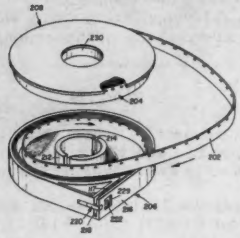
3,606,184
CONTINUOUS LOOP TAPE RECORDER WITH DRIVEN TAPE PACK
Stanley R. Fencel, Westminster, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Apr. 24, 1968, Ser. No. 723,736
Int. Cl. B65h *17/46, 17/48*
U.S. Cl. 242—55.19R **5 Claims**



A tape recorder of the endless loop type in which the tape, pack, or "cartridge," is supported around a hub, which is positively driven by the same belt which couples the capstans to the drive motor.

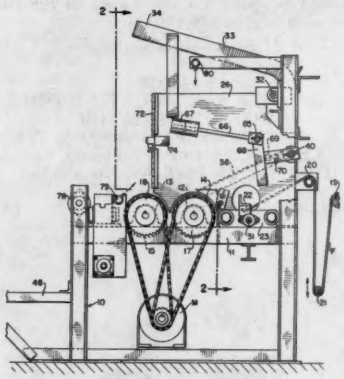
3,606,185
NON-REWIND CARTRIDGE FOR ROLL OF STRIP MATERIAL
William A. Martin, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of application Ser. No. 659,938, Aug. 11, 1967. This application Feb. 13, 1970, Ser. No. 11,268
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.21 **15 Claims**

A non-rewind cartridge for use on an apparatus, such as film or tape projector, wherein a rotatable holder winds up entering strip material from the periphery of the holder inwardly so that the lead portion of the strip material is



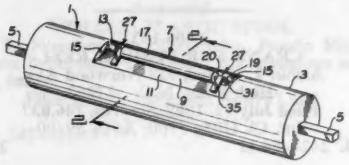
outermost; and the roll of strip material is also disposed in supply form in the same cartridge.

3,606,186
AUTOMATIC ROLL-UP BATCHER
Eugene Cohn, Great Neck, and Andrew P. Cecere, Valley Stream, N.Y., assignors to Samcoe Holding Corporation, Woodside, N.Y.
Filed Oct. 18, 1968, Ser. No. 768,872
Int. Cl. B65h *19/20*
U.S. Cl. 242—56R **20 Claims**



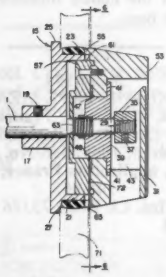
The invention is directed to a roll-up batcher for web materials, particularly knitted fabrics, which is characterized particularly by its simplified construction and low overall cost, while having a plurality of desirable operational features and being substantially automatic in operation. The roll-up batcher receives knitted fabric or other web material continuously, rolls it about a core tube to provide a roll or "batch" of predetermined size. The batch roll is cut from the web and removed, and the winding of a new batch roll is automatically commenced. The equipment of the invention utilizes lightweight core tubes, to facilitate handling of the roll of batches; it is readily adjustable in width, to accommodate various widths of fabric or other web material; it easily handles the winding of very small diameter "sample size" rolls; and it is arranged so that core tube loading and batch unloading may be readily accomplished from the front or discharge side of the equipment.

3,606,187
CLUTCH FOR TIGHTENING WINDING TUBE ON WINDUP SHAFT
Kenneth H. Hahn, 4336 Berwick,
Toledo, Ohio 43612
Filed Apr. 17, 1970, Ser. No. 29,592
Int. Cl. B65h *75/30;* F16d *41/07*
U.S. Cl. 242—68.2 3 Claims



Sheet goods are conventionally solid in roll form wherein the roll is wound upon a hollow tube that is of a length and diameter such that it may be fitted into various processing machinery. Conventional windup machines for these roll goods utilize clutches as pivotal teeth clutch assemblies and sliding cable clutch assemblies to tighten the winding tube on the windup shaft during the winding operation; these devices frequently jam, very often damage the inner surface of the winding tube, and frequently require attention. This invention is a roller type clutch for mounting on a windup shaft for tightening a winding tube thereto that provides jam-free operation, that does not damage the winding tube, and that requires very little, if any, maintenance.

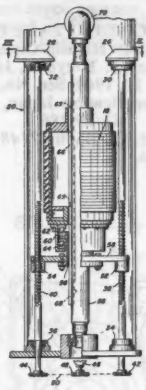
3,606,188
DEVICE FOR SECURING A MAGNETIC TAPE REEL
Jack M. Wagner, Arcadia, Calif., assignor to
Data Devices, Inc.
Filed May 12, 1969, Ser. No. 823,687
Int. Cl. B65h *17/02, 75/02*
U.S. Cl. 242—68.3 2 Claims



A device for securing and driving reels of magnetic tape to devices on which they are used, comprising a rim having an elastomeric compressible layer about its outer periphery and a movable hub element which compresses and expands the elastomeric material to secure a tape reel thereon, further including a plurality of projectable finger elements which extend radially outward, covering a reel prior to the compression and expansion of the elastomeric element.

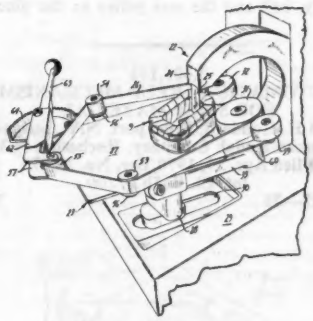
3,606,189
METHOD AND APPARATUS FOR COILING STRIP
Leroy J. Johnson, Valparaiso, Ind., assignor to
United States Steel Corporation
Filed Apr. 2, 1970, Ser. No. 24,984
Int. Cl. B21c *47/02;* B65h *23/02*
U.S. Cl. 242—78.1 7 Claims

In uncoiling an open coil of steel strip arranged with its axis vertical and recoiling the strip into a tight coil also arranged with its axis vertical, the strip passes around a vertical tension drum with a vertical snubber roll bearing against the strip on the tension drum in order to position the strip in a desired vertical position. The snubber roll has a spline connection with a rotatable shaft fixed in a vertical position. Movement of the strip causes rotation of the snubber roll and its shaft. The snubber roll is connected



to two diametrically opposed nuts which engage vertical threaded guide rods which are rotated in unison by a reversible motor. If the strip wanders from its desired position the operator runs the motor in the desired position to raise or lower the snubber roll while the coiling continues to return the strip to the desired position.

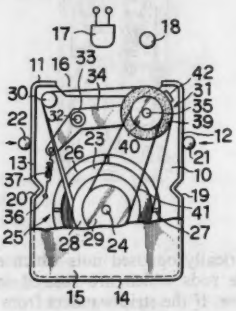
3,606,190
APPARATUS FOR TAPING CLOSED COILS
James R. Burton, Franklin, Wis., assignor to
McGraw-Edison Company, Milwaukee, Wis.
Filed Sept. 12, 1968, Ser. No. 759,443
Int. Cl. B65h *81/02;* H01f *41/12*
U.S. Cl. 242—6 3 Claims



Apparatus for wrapping an insulating tape on a rectangularly shaped, prewound primary coil of a lighting transformer. An endless belt passes about a plurality of guide rollers one of which is movable laterally for release of the belt tension. The guide means includes a pair of drive wheels frictionally engaging the inner periphery of belt and providing movement thereof. The drive wheels are mounted in spaced relation slightly greater than the maximum width of tape and the belt is pulled inwardly

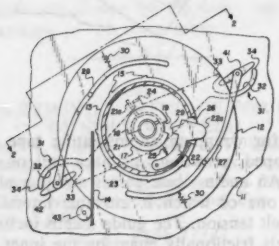
between the two drive wheels to define an inner drive loop. The coil is disposed within the loop and by increasing the belt tension is moved outwardly into friction driving engagement with the belt at the point of contact to the drive wheels. A wrapping head is driven in timed relation with the driven coil to apply overlapping turns of tape on the coil.

3,606,191
ENDLESS MAGNETIC TAPE CARTRIDGE
Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan
Filed May 12, 1969, Ser. No. 823,786
Claims priority, application Japan, May 15, 1968, 43/39,286
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.19A **3 Claims**



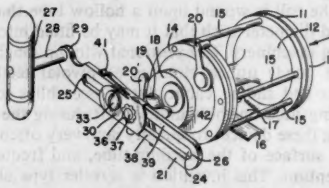
An endless magnetic tape cartridge which is capable of recording and reproducing by an endless magnetic tape cartridge playing apparatus including a magnetic head and a rotary driving capstan, comprising a cartridge housing, a reel rotatably provided within the cartridge housing, an endless magnetic tape spirally wound to the reel, a pinch roller rotatably provided within the housing, a reel pulley provided on the reel, a pinch roller pulley provided on the pinch roller, and a belt interposed between the reel pulley and the pinch roller pulley. The tape is drivingly transported between the capstan and the pinch roller and the reel is rotated through the pinch roller pulley, belt and the reel pulley as the pinch roller is rotated.

3,606,192
AUTOMATIC TAKEUP MECHANISM FOR STRIP MATERIAL
William H. Goddard, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 17, 1970, Ser. No. 29,575
Int. Cl. B65h *27/00*
U.S. Cl. 242—76 **7 Claims**



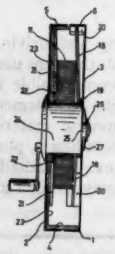
A takeup mechanism for directing strip material, such as motion picture film, onto a rotatable core in a device for handling such material, includes a plurality of curved guiding fingers for directing the free leading end of the strip material toward the core member for engagement by such core member. Means are provided which are effective automatically in response to strip build-up on the core for moving the ends of the fingers away from the core and out of contact with the strip material.

3,606,193
CRANK FOR FISHING REEL
Arthur L. Allred, 929 Norwood Ave., High Point, N.C. 27262
Filed July 19, 1968, Ser. No. 746,037
Int. Cl. G05g *1/00;* **A01k** *89/00*
U.S. Cl. 242—84.1J **2 Claims**



An adjustably extensible handle for attachment to the driving boss of a conventional fishing reel. The handle includes a crank arm having a knob at one end and an elongated slot positioned over the boss and retained thereon by a clamping plate. The clamping plate has a serrated opening fitting over a correspondingly shaped spool drive spindle of the reel and is retained thereon by an offset screw seated in a tapped opening in the driving boss. The elongated slotted portion of the handle is slidable on the boss to attain the crank arm length desired after which a resilient finger of the clamp inhibits free displacement of the crank on the boss.

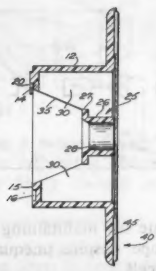
3,606,194
CASING FOR TAPE MEASURE
Andre Quenot, Besancon, France, assignor to Quenot & Cie S.a.r.l., Besancon, France
Filed Mar. 5, 1969, Ser. No. 804,716
Claims priority, application France, Apr. 22, 1969, 148,905
Int. Cl. B65h *75/16*
U.S. Cl. 242—84.8 **9 Claims**



A tape measure casing having a mandrel positioned therein for supporting a coiled measuring tape. The mandrel has radial fingers for cooperation with a spring having corresponding radial fingers for guiding the winding of the tape and for acting as a brake on the coiled tape. The mandrel is provided with slots in its peripheral face for receiving the outer extremities of the spring

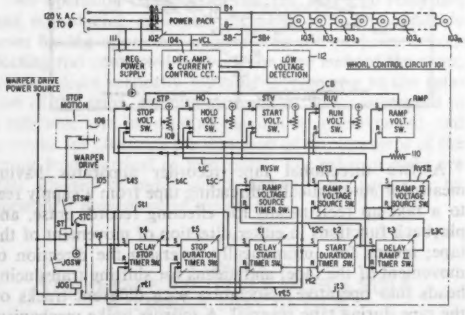
fingers to prevent rotation of the spring, but to allow axial movement of the spring fingers as they bear on the tape. Other braking means can be held in place by the mandrel or secured thereon, and the mandrel can also carry an outlet allowing the tape to be tangentially withdrawn from the casing.

3,606,195
MOLDED PLASTIC SPOOL
Hovey T. Freeman, Jr., Guaynabo, Puerto Rico, and William B. Schlegel, Cranbury, N.J., assignors to Durafoam, Inc.
Filed Feb. 7, 1969, Ser. No. 797,424
Int. Cl. B65h *75/14*
U.S. Cl. 242—118.7 **3 Claims**



A spool formed of substantially identical halves, each having a cylindrical drum with an abutting surface at one end and a flange at the other end, the abutting surfaces being keyed together and the flanges being so formed that the spool will not shift when co-axially positioned one on the other in stacked relation. A hub is provided for receiving an arbor which is mounted by webs extending between the hub, the barrel and its flanges, the webs also providing a driving slot.

3,606,196
WHORL CONTROL SYSTEM
George Waller Heard, Cheshire, Conn., assignor to Allied Control Company, Incorporated, Plantsville, Conn.
Filed June 1, 1970, Ser. No. 41,987
Int. Cl. B65h *57/00, 59/16*
U.S. Cl. 242—155M **12 Claims**

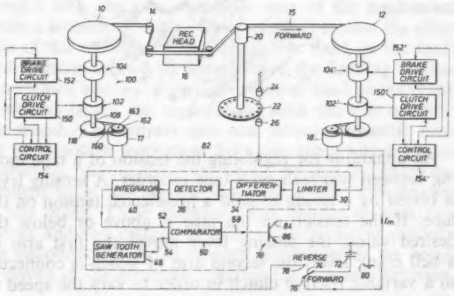


Circuits are disclosed to control the power supply furnishing D.C. voltage to a plurality of electromagnetic whorl tension devices which control the tension of a plurality of yarns during the production of a beam by a warper. Five voltage level controls, five adjustable timing controls and two ramp voltage controls are disclosed to enable the application of the tension to the plurality of yarns to be within close tolerances of a selected running tension level during the starting, running and stopping of the beaming operation.

3,606,197
PLURAL CYCLE CAM YARN WINDING PROCESS AND PACKAGES PRODUCED THEREBY
Richard L. Akers, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed June 3, 1969, Ser. No. 830,054
Int. Cl. B65h *54/28, 54/38*
U.S. Cl. 242—176 **7 Claims**

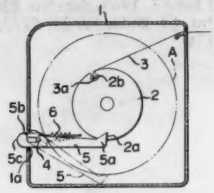
A process for winding yarn into a cylindrical-bodied package wherein the yarn is traverse wound in layers of helical coils on a bobbin wherein the coils are laid down in their reversals in different shaped curves in a repeating progression throughout the winding of the package. The corresponding stroke lengths of the coils with different shaped reversals may also be of different lengths.

3,606,198
TAPE TRANSPORT
Cecil R. Gilbreath and Henry T. Ray, Houston, Tex., assignors to Geo Space Corporation
Filed June 19, 1969, Ser. No. 834,736
Int. Cl. B65h *59/38;* **G11b** *15/52, 15/54*
U.S. Cl. 242—186 **8 Claims**



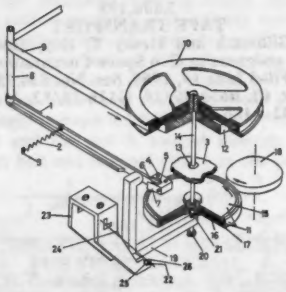
This invention is concerned with magnetic tape transports which include a supply reel and a takeup reel for moving magnetic recording tape about a magnetic read-write head. Each reel preferably has a drive motor. A transducer senses linear tape speed errors by producing a signal having a parameter which is proportional to the instantaneous speed of the tape. This signal is converted for comparison with a standard signal and the output of the comparator network is used to control the speed of the driving motor.

3,606,199
DEVICE FOR TERMINATING UNWINDING OF BELT-SHAPED BODY FROM A SPOOL
Sakae Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Apr. 15, 1969, Ser. No. 816,199
Claims priority, application Japan, Apr. 17, 1968, 43/26,263
Int. Cl. B65h *25/04, 63/08;* G11b *23/10*
U.S. Cl. 242—187 5 Claims



Device for terminating unwinding of film or tape on a spool. A spring biased lever follows an unwinding and decreasing film supply to engage a notch on the spool for the termination. Signal means are provided in association with the lever to indicate the termination.

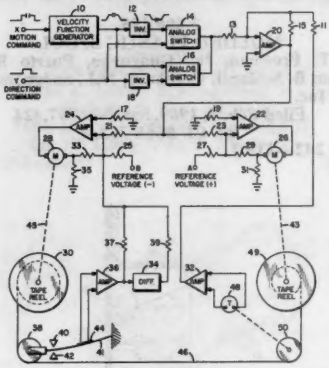
3,606,200
TAPE TENSION CONTROL SYSTEM WITH A SENSING LEVER, PARTICULARLY FOR MAGNETIC SOUND RECORDERS
Hubert O. Richt, 4 Buchenweg, 8135 Soecking, Germany, and Albert Liebl, 12 Am Muhleich, 813 Starnberg, Germany
Filed Aug. 23, 1968, Ser. No. 757,806
Claims priority, application Germany, Aug. 24, 1967, P 15 49 043.4
Int. Cl. B65h *59/38, 63/02;* G03b *1/04*
U.S. Cl. 242—189 6 Claims



An apparatus for regulating the tension of a tape moving between two reels on a tape recorder. A sensing lever is biased by a spring to hold a preselected tension on the tape. If the tension on the tape is above or below the desired value, the sensing lever moves the first arm of a bell crank lever, the second arm of which is connected to a variable friction clutch in order to vary the speed of the reel to adjust the tape tension.

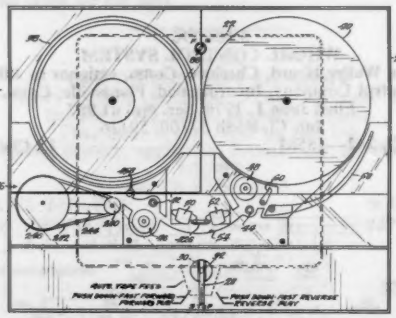
3,606,201
CONSTANT SPEED, CONSTANT TENSION TAPE TRANSPORT
Neil J. Petusky, Lafayette Hills, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Filed July 15, 1969, Ser. No. 841,834
Int. Cl. B65h *59/38, 63/02;* G03b *1/04*
U.S. Cl. 242—190 13 Claims

The instant invention relates to a constant speed tape transport system which utilizes a minimum of two motors in the tape drive mechanism and two closed loop servo systems comprising a velocity loop and a tension loop. Both loops are active in both the static and dynamic states of the system. A signal is generated in the tension



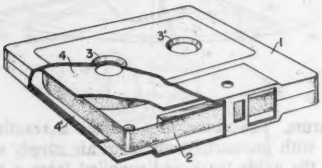
loop in either state for maintaining approximately equal tension in the tape despite unequal tape radii on the associated tape reels.

3,606,202
TAPE RECORDER
Noman L. Williams, Villa Park, and Allen L. Ryan, Chicago, Ill., assignors to Warwick Electronics Inc.
Filed Sept. 11, 1967, Ser. No. 666,739
Int. Cl. G11b *15/32, 15/66*
U.S. Cl. 242—192 7 Claims



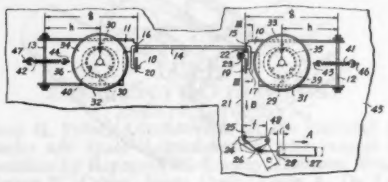
A two directional tape recorder apparatus having means for automatically threading tape from a supply reel to a take-up reel; means for effecting record, erase, and playback functions in either direction of movement of the tape; means for automatically reversing the direction of movement of the tape; and means for shifting transducing heads into operative association with different tracks on the tape during tape reversal. A scissors brake mechanism is provided for stopping supply and takeup turntables and to release the turntables for rotation during wind, rewind, fast wind and fast rewind operations; and a single control is provided to actuate separate slide members for selecting wind and rewind, and fast wind and fast rewind functions, with means being provided for shifting tape away from the transducing heads during fast wind and fast rewind functions.

3,606,203
CASETTE ENCAPSULATING MAGNETIC RECORDING TAPE
Goro Akashi, Masaaki Fujiyama, and Takashi Hirakawa, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 13, 1969, Ser. No. 865,711
Claims priority, application Japan, Oct. 12, 1968, 43/74,388
Int. Cl. G03b *1/04*; B11b *15/32, 23/04*
U.S. Cl. 242—199 5 Claims



A cassette enclosing a magnetic tape wherein the cassette contains a plastic regulating plate. The plastic regulating plate contains finely divided particles dispersed therein.

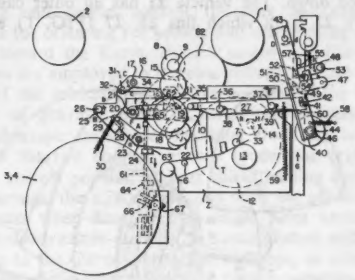
3,606,204
OPERATION CHANGING DEVICE FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS
Mitsuo Iwata, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed May 23, 1969, Ser. No. 827,184
Claims priority, application Japan, May 25, 1968, 43/35,081; Feb. 14, 1969, 44/10,508
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—201 8 Claims



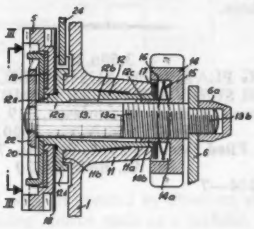
An operation changing device for magnetic recording and reproducing apparatus including vertically rotatable arms having oppositely aligned free end portions, a connecting rod connected between the free ends of the arms, take-up disks vertically movable in response to the rotation of the arms, a string, one end of which is secured to a rotatable arm for rotating the arm by its movement, and a means for changing the direction of displacement of the string from vertical to horizontal. The take-up disks are thus adapted to move simultaneously and vertically by horizontal movement of the string.

3,606,205
VIDEO-TAPE RECORDER WITH A STILL REPRODUCTION DEVICE
Soji Nakamoto, Osaka Prefecture, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi-shi, Japan
Filed Sept. 12, 1969, Ser. No. 857,358
Claims priority, application Japan, Sept. 14, 1968, 43/66,280, 43/79,614
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—206 13 Claims

A video-tape recorder with still motion reproduction device which is able to adjust finely the scanning position of the tape on the rotary head and/or to change the picture frame of the tape one by one by rotating the capstan together with the tape keeping suitable tension for reproducing easily a desirable still picture without beat-noise.



3,606,206
SPIN CASTING REEL
Maurice Jacquemin, Clauses, France, assignor to Carpano & Pons, Clauses, France
Filed Dec. 30, 1968, Ser. No. 787,755
Claims priority, application France, Feb. 7, 1968, 139,013
Int. Cl. A01k *89/02*
U.S. Cl. 242—220 6 Claims

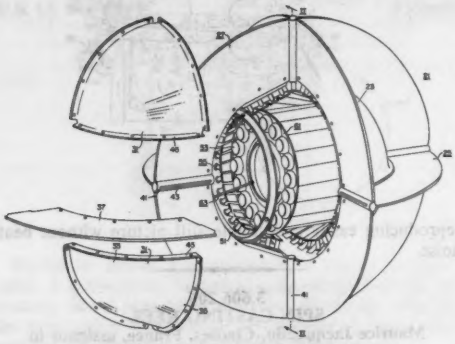


A pin casting reel having a clutch device in which the torque limiting mechanism has a nut which screws on a crank shaft, with a ratchet wheel slidingly mounted on the shaft to lock the same in one direction. The ratchet wheel is urged by a spring against a friction washer in contact with one side of a drive gear of the mechanism while a second friction washer is applied against the other side of the wheel by a supporting disc fixed on the shaft and forming one of the members of the limiting mechanism which also has a movable member fixed on the crank shaft and facing the support disc from the side opposite the wheel. The support disc and movable member bear on one another through at least one ramp which makes possible a relative axial movement of said members dependent upon the angular position of one with respect to the other. These members also having at least two checks and two catches adapted to cooperate to produce the disconnection of the limiting member when the crank is driven in the direction opposite the winding direction.

3,606,207
REENTRY VEHICLE FOR THERMOELECTRIC GENERATOR
Robert I. Weiner, Pikesville, Md., and Alvin H. Kasberg, Murrysville, and Carl Alvin Bodenschatz, Indiana, Pa., assignors to Nuclear Materials and Equipment Corporation, Apollo, Pa.
Filed Mar. 8, 1968, Ser. No. 711,619
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 10 Claims

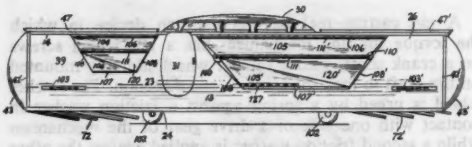
A vehicle 21 of the unoriented type, particularly a radioactive isotope thermoelectric generator for use in space

which is capable of intact reentry and survival in the earth's atmosphere. The vehicle is also capable of offering sufficient protection to radioactive capsules 53 or the like which it carries that these capsules are not buried, broken or melted down. The vehicle 21 has an outer casing or enclosure 23 from which fins 25, 27 (FIG. 1) extend,



the fins predominately mutually support each other and do not rely on support by the casing 23. Specifically the casing is in the form of a sphere and the fins are in the form of a grid of orthogonal rings extending at right angles to the sphere.

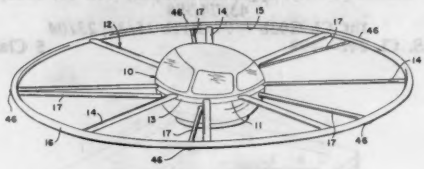
3,606,208
FLYING PLATFORM-AUTOMOBILE BOAT AND AIR SUSPENSION CAR COMBINATION
Steven Postelson-Apostolescu, 419 W. 35th St., New York, N.Y. 10001
Filed Dec. 11, 1968, Ser. No. 789,640
Int. Cl. B64c 27/20
U.S. Cl. 244—7 **12 Claims**



An aircraft having an elongated fuselage, angular sectionalized wings mounted on the side wall of the fuselage, and the front wings being smaller than the rear wing. A wing member is hinged on each of the larger and smaller wings and including means to tilt the wing member upward or downward for additional lift. The wings having a passage extending therethrough in which a jet engine is mounted and means to exhaust gas from the jet engine rearward, downward and into the horizontally directional vents. The fuselage being provided with rotor blade and motive means for ground effect and normal flight including means for controlling the direction of flight.

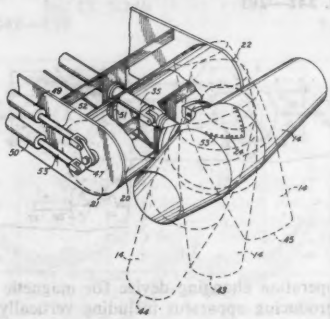
3,606,209
TURBINE DRIVE FOR ROTARY WING AIRCRAFT
William N. Rosta and Russelle L. Maxwell, Fort Worth, Tex., assignors to The VLM Corporation, Fort Worth, Tex.
Filed Jan. 26, 1970, Ser. No. 5,464
Int. Cl. B64c 27/20
U.S. Cl. 244—12 **19 Claims**

A rotary wing, vertical lift aircraft includes a central fuselage and a rotor consisting of an inner annular hub rotatably supported on and encircling the fuselage, radially extending rotor blades and an outer ring connecting the outer ends of the blades. The rotor ring is guided in an annular guide track supported on the body by means of



radial struts. The rotor ring defines a reaction turbine supplied with pressurized air from air supply stations located in the guide track and supplied from a compressor within the fuselage through the supporting struts.

3,606,210
ENGINE MOUNTING FOR VTOL AIRCRAFT AND THE LIKE
Ralph E. Busby, 1620 9th St., Greeley, Colo. 80631
Filed Nov. 6, 1969, Ser. No. 874,519
Int. Cl. B64d 27/06
U.S. Cl. 244—12A **6 Claims**

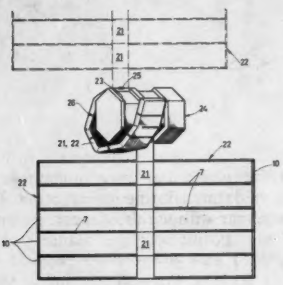


An engine mounting for aircraft capable of horizontal and vertical flight comprises a cylindrical base pivotally mounted on a horizontal longitudinal axis and having a portion constituting a continuation of the surface of the airfoil. An engine, preferably of the jet propulsion type, is mounted on a laterally extending housing projecting from the cylindrical base and provided with a ring bearing affording 180° of rotation of the engine in a plane parallel to the axis of the base whereby the engine may be positioned to direct its thrust forwardly, upwardly or in reverse and may be inclined from the vertical to either side when in its upward thrust position to produce a lateral thrust component. The engine pod structure is rotated by turning it on a shaft which intersects the axis of the base and passes through the base. A universal joint in the shaft affords bending of the shaft at the pivotal axis of the base. The lateral housing and bearing ring preferably have diameters of the order of that of the engine pod.

3,606,211
OUTRIGGER CONSTRUCTION

Wolfgang Roersch and Günther La Roche, Munich, Germany, assignors to Messerschmitt Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed June 30, 1969, Ser. No. 837,713
Claims priority, application Germany, Oct. 8, 1968, P 18 01 777.1
Int. Cl. B64g 1/00
U.S. Cl. 244—1SS 26 Claims

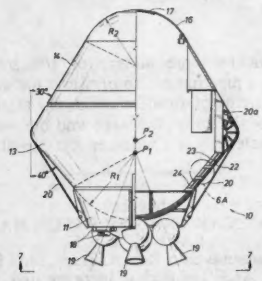


An outrigger secured to a space vehicle is displaceable between an inoperative position mounted in a compact arrangement against the vehicle and an operative position in which it is extended outwardly from the vehicle. The outrigger is formed of a main outrigger section which extends outwardly from the vehicle in the operative position and auxiliary outrigger sections which extend laterally from the main outrigger section in the operative position. In the inoperative position the auxiliary outrigger sections are disposed in a folded arrangement on the main outrigger section.

3,606,212
EMERGENCY EARTH ORBITAL ESCAPE DEVICE

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention by Raymond H. Bradley, Houston, Tex., and Warren K. Carter, Santa Cruiz, Louis A. De Lateur, San Jose, and Dean Chowing, Sunnyvale, Calif.

Filed Feb. 2, 1970, Ser. No. 7,669
Int. Cl. B64g 1/00
U.S. Cl. 244—15.5 11 Claims

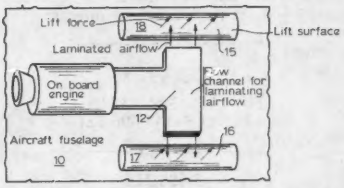


A space vehicle constructed from dissimilar right angle conical sections mated along their bases and having their apexes truncated and spherically rounded to provide the unique property of single point aerodynamic and hydrodynamic stability. A 40° half-angle cone section forms the forward end of the vehicle and is covered with a heat shield of ablative material to dissipate heat generated upon reentry into the Earth's atmosphere. A 30° half-angle cone forms the aft section and includes an entry hatch and window. A separable module secured to the leading end carries control thrusters and retrorocket motors for orienting the vehicle and decelerating it out of orbit toward the Earth. Passive power and life support systems are employed to increase storage life and reaction time of the vehicle. The relative position of the vehicle's center of gravity, center of aerodynamic pressure and hydrodynamic metacenter resulting from the configuration of the two conical sections render the craft stable in the correct position of heat shield leading during free fall through the atmosphere and with the aft end above the water when floating. This single point aerodynamic and hydrodynamic stability is accomplished without resorting to the use of outriggers, balloons, or other flotation devices required in existing reentry vehicles.

3,606,213
LAMINAR FLOW STRUCTURE

Eugene J. Lubimov, 668 Sirine Ave., Virginia Beach, Va. 23462

Filed May 5, 1969, Ser. No. 821,855
Int. Cl. B64c 3/00
U.S. Cl. 244—35 3 Claims

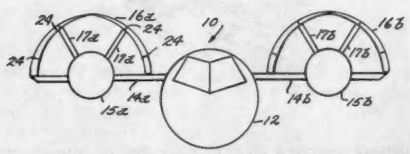


An air foil lift effect is created by directing air from an onboard pressurizing source such as a turbine, through a channel which tends to laminate the flow and to direct the laminated flow against a curved surface where the lift effect is produced.

3,606,214
AIRFOIL

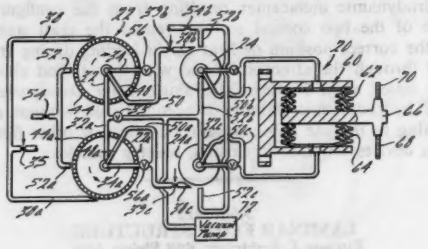
Galen E. Calvert, 7540 Beluga, Anchorage, Alaska 99504

Filed Oct. 8, 1969, Ser. No. 864,859
Int. Cl. B64c 3/44, 3/54
U.S. Cl. 244—4.3 16 Claims



An airfoil construction is described in which the flight characteristic of the airfoil is changed by rotating same to present a different leading edge to the relative wind. One disclosed embodiment is constructed as to permit the rotation to occur by means of a change in attitude of the aircraft. The other disclosed embodiments provide for mechanical rotation of the airfoil. An aircraft construction including a mode of attachment of the airfoils thereto is described.

3,606,215
FLUID CONTROL SYSTEM
Kenneth W. Verge, Farmington, and Lael B. Taplin, Livonia, Mich., and George I. Boyadjieff, Woodland Hills, Calif., assignors to The Bendix Corporation
Original application May 4, 1966, Ser. No. 547,595, now Patent No. 3,525,488, dated Aug. 25, 1970. Divided and this application Apr. 24, 1969, Ser. No. 819,061
Int. Cl. B64c *13/36*
U.S. Cl. 244—78 1 Claim

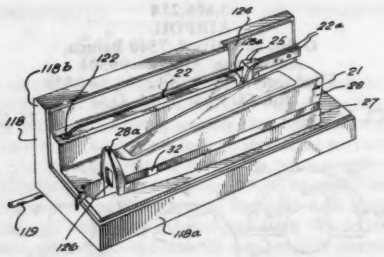


A control system for a craft having a vortex rate sensor on an inclined axis for sensing rate of roll and yaw of the craft and a compass or the like for determining direction of the craft, in combination with a fluid operable actuator for controlling craft roll, yaw and direction.

ERRATUM

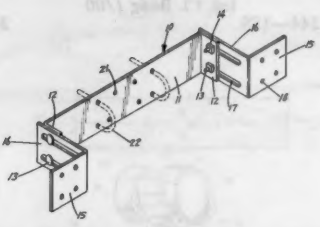
For Class 244—122 see:
Patent No. 3,606,221

3,606,216
BATTERY POWERED ELECTRIC KNIFE
Worthy L. Chambers, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Original application Aug. 24, 1966, Ser. No. 574,648, now Patent No. 3,432,702, dated Mar. 11, 1969. Divided and this application Nov. 12, 1968, Ser. No. 775,064
Int. Cl. A47g *21/14*
U.S. Cl. 248—37.3 4 Claims



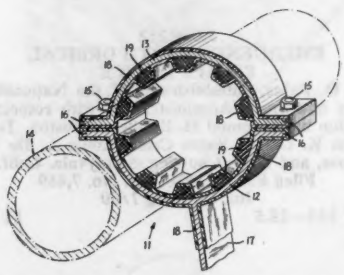
A battery operated electric knife having an elongated housing defining the knife handle and enclosing an electric motor and battery unit. A pair of charging contacts are mounted entirely within the elongated housing with access openings thereto and a charging and storage stand are provided shaped to receive the knife handle in only one predetermined position whereby said housing for the electric knife may be resiliently clamped in assembled relationship with the charging unit. An improved permanent magnet rotor is employed having an outer field member comprising a resilient cylindrical shell with a slit therein.

3,606,217
BATHTUB FAUCET BRACKET
Robert J. Leiferman, 308 Davis St., Mankato, Minn. 56001
Filed Sept. 8, 1969, Ser. No. 855,858
Int. Cl. F16l *3/22*
U.S. Cl. 248—68 7 Claims



A bracket for quick and easy mounting of bathtub faucet and valve fixtures during construction. The bracket has a horizontal bar with a pair of arcuate clamping bolts for securing and positioning the fixture and a pair of laterally displaced ears at opposite ends of the bar to attach it to the studs of the wall framing at the construction site. The bathtub fixture may be side mounted or top mounted relative to the bar. The bar may be adjustably connected to the ears for attaching the bracket to the studs to permit variations in spacing of the fixture relative to the bathroom wall.

3,606,218
SOUND AND VIBRATION ISOLATION SUPPORT
Helmer L. F. Enlund, Waterford, and Enos V. Stanhope, Groton, Conn., assignors to General Dynamics Corporation, New York, N.Y.
Filed Mar. 21, 1969, Ser. No. 809,287
Int. Cl. F16l *3/10*
U.S. Cl. 248—74 1 Claim

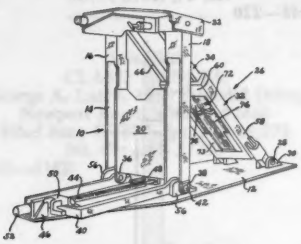


In the particular embodiment of the invention described herein, a pipe hanger comprises a metal strap, with a plurality of strips of resilient meaterial attached to the inner surface of the strap, the strap and the resilient strips being encapsulated by a coating of elastomeric material.

3,606,219
RAILWAY CAR TRAILER HITCH HAVING A SAFETY LOCK
James C. Hammonds and Roy R. Dare, St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Apr. 21, 1970, Ser. No. 30,477
Int. Cl. B60p *7/06;* B61d *3/16*
U.S. Cl. 248—119S 7 Claims

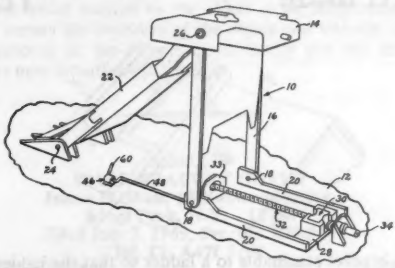
A railway car trailer hitch with oleo-pneumatic cushions in a telescoping diagonal strut includes safety means for preventing the hitch from failing to support the trailer,

or to hold it securely, upon a loss of cushioning pressure. The safety means includes a locking bar adapted to be released by Belleville washers to lock the diagonal strut in a normally extended position when the cushion pressure



falls below a safe value. The Belleville washers are encased in a housing which prevents the normally occurring variations of cushions force from being applied to the washers, thus reducing fatigue of the washers.

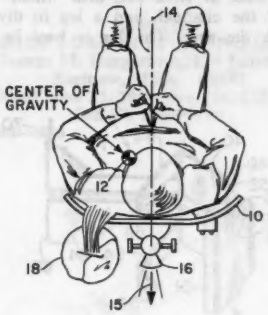
3,606,220
MEANS TO LUBRICATE SCREW OPERATED TRAILER HITCHES
James C. Hammonds and Robert W. Randolph, St. Charles, and Richard P. Yeates, Bridgeton, Mo. assignors to ACF Industries, Incorporated, New York, N.Y.
Filed May 25, 1970, Ser. No. 40,997
Int. Cl. B60p *7/06;* **B61d** *3/16*
U.S. Cl. 248—119S **6 Claims**



A nut mounted on an externally threaded screw for raising and collapsing a trailer hitch on a railway car upon rotation of the screw is supplied with lubricant for lubricating the screw upon each cycle of raising and collapsing the hitch. A supply of lubricant is in fluid communication with a lubricant well within the nut and actuating means is operatively connected to the lubricant supply to force upon actuation a predetermined amount of lubricant from the lubricant supply to the nut. The actuating means is responsive to the movement of the trailer hitch between collapsed and raised positions and is actuated upon each cycle of raising and collapsing the hitch thereby to provide lubricant to the nut and screw upon each cycle of hitch operation.

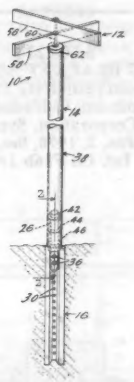
3,606,221
AIRCRAFT ROCKET EJECTION SEAT SYSTEM
John B. Morris, Reynoldsburg, Ohio, and Frank H. Wallace, Fort Walton Beach, Fla., assignors to the United States of America as represented by the Secretary of the Navy
Filed Apr. 1, 1970, Ser. No. 24,697
Int. Cl. B64d *25/10*
U.S. Cl. 244—122 **3 Claims**

An aircraft rocket ejection seat system characterized by the lateral separation of the seats, upon ejection, with respect to the line of flight, at least one seat structure assembly having its center of gravity located to the right



or left of the plane which is coincident with the line of thrust of the catapult-rocket.

3,606,222
SUPPORT CONSTRUCTION FOR SIGNS
Edward J. Howard, 4244 River Road, Toledo, Ohio 43614
Filed Apr. 28, 1969, Ser. No. 819,636
Int. Cl. F16m *13/00;* **E04h** *12/22*
U.S. Cl. 248—156 **4 Claims**

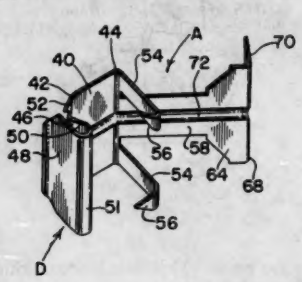


A street sign support is of the break-away type and includes a first post driven completely into the ground, a second post bolted to said first post and extending above the ground, and a third, sign-supporting post extending down over the second post to a point near the ground and carrying a street sign assembly at the top. The third post has notches in the lower end thereof fitting over flanges of the first post to prevent relative rotation between the third and first posts. The third post and the second are connected by means of washers which bite into the outer surface of the second post and the inner surface of the third when an attempt is made to separate these two posts.

3,606,223
OUTLET BOX MOUNTING CLIP
Leslie N. Havener, Euclid, Ohio, assignor to Spring Steel Fasteners, Inc., Cleveland, Ohio
Filed Mar. 21, 1969, Ser. No. 809,061
Int. Cl. H02g *3/12*
U.S. Cl. 248—205 **7 Claims**

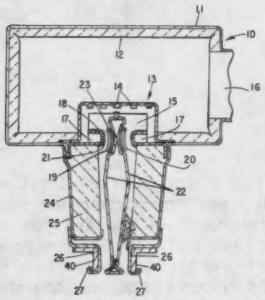
An interim mounting clip for use in dry wall partition construction, adapted to temporarily hold an electrical

outlet box onto a U-shaped metal channel stud prior to fastening dry wall panels to the stud flanges. The clip comprises a portion adapted to fit over and grip an edge of the outlet box, at least one arm which engages a flange edge of the channel, and a leg in diverging relationship with the arm. The leg is bent in a reverse



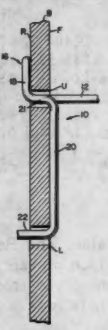
direction intermediate its ends to define upper and lower portions and a knee at the bend of the leg, the leg lower portion being wedged in the corner between the flange and base of the stud. The clip thereby supports the outlet box in position until the dry wall is installed and forms the final support.

3,606,224
MOUNTING BRACKET ASSEMBLY FOR AIR CONDITIONING TERMINALS
August William Gutheim, Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Jan. 2, 1970, Ser. No. 347
Int. Cl. F16b *1/00*
U.S. Cl 248—214 **8 Claims**



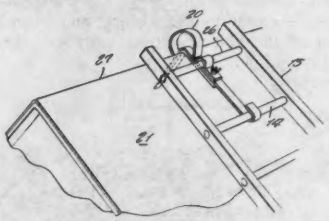
A bracket assembly for mounting a ceiling air conditioning terminal to the frame members of the ceiling of the area being served by the terminal. The bracket assembly includes at least one member for engaging the ceiling terminal and a second member connected to the first member and adapted to be cooperatively connected to a portion of the frame member. A portion of the bracket assembly is operable to transfer the load provided by the ceiling terminal to the upper portion of the ceiling frame member, the load being equally distributed about the midpoint of the frame member so that no turning moments will be created thereon.

3,606,225
APERTURED BOARD CLIP
Laurence J. Rasmussen, 608 Sunrise Ave., Stevens Point, Wis. 54481
Filed Mar. 11, 1969, Ser. No. 806,259
Int. Cl. A47b *97/00*
U.S. Cl. 248—220 **2 Claims**



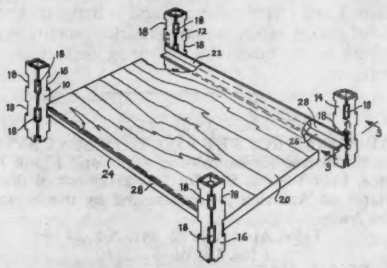
An apertured board clip having a plurality of laterally spaced elements for engagement with the board to stabilize the article supporting arm which extends outwardly of the board.

3,606,226
RIDGE LADDER BRACKET
Wesley V. Bell, Sr., 3804 S. Randolph St., Indianapolis, Ind. 46227
Filed Apr. 23, 1969, Ser. No. 818,693
Int. Cl. E04g *3/12*; **F06c** *1/36*
U.S. Cl. 248—237 **2 Claims**



A bracket attachable to a ladder so that the ladder may be supported from a ridge of a roof, the ridge bracket including a holding bar, a reinforcement bar, a U bracket, a hoop slide and a wing nut bolt.

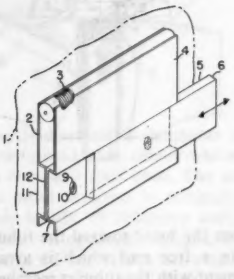
3,606,227
SHELF-SUPPORT FOR BINS
Herbert H. Klein, Arlington Heights, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.
Filed June 4, 1970, Ser. No. 43,343
Int. Cl. E06b *7/28*
U.S. Cl. 248—243 **3 Claims**



A removable shelf-support bracket which integrally defines spaced mounting fingers and an elongated angle

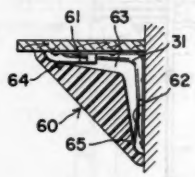
bracket for vertical support and lateral confinement of the shelf is provided for selective connection between a pair of upright sheet metal posts, each of which posts is provided with a plurality of vertically aligned slots adapted for selectively receiving the mounting fingers of the bracket.

3,606,228
CLAMP HANGER
George A. Lasko, 1508 Westcliff Drive, Newport Beach, Calif. 92660
Filed June 1, 1970, Ser. No. 41,878
Int. Cl. A47j *51/08*
U.S. Cl. 248—316B 1 Claim



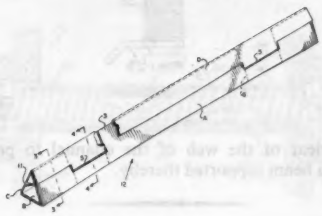
A clamp type hanger for trousers and other objects wherein initial contact by the object to be hung automatically causes the retention of the object and wherein manual removal of the object automatically sets the device for the next retention of an object.

3,606,229
WALL BRACKET COVER
James D. Wall, 18 Boxwood Drive, Kings Park, N.Y. 11754
Filed July 7, 1969, Ser. No. 839,609
Int. Cl. A47f *5/08*
U.S. Cl. 248—345 1 Claim



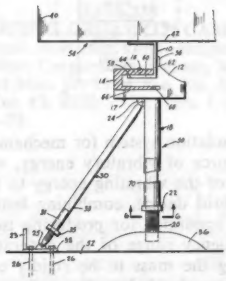
A wall bracket cover has been provided which can be easily assembled over an existing wall bracket supporting a shelf and fastened by various devices having snap engagement with the bracket or by grooves engaging flanges of the bracket covers with the under surfaces of the shelf and wall surface or by adhesive means made available by removal of adhesive cover strip from horizontal and vertical run surfaces of the bracket cover. This bracket cover itself is preferably formed of molded plastics or metal and may be formed of wood chips, papier mache or any other suitable material with the attached device embedded in the material and projected into the bracket receiving opening of the horizontal and vertical faces of the bracket.

3,606,230
CARTOP LOAD SUPPORTING DEVICE
George M. Hargreaves, 124 Larch St., Saginaw, Mich. 48602
Filed June 13, 1969, Ser. No. 833,124
Int. Cl. B60r *9/04*
U.S. Cl. 248—346 9 Claims



A cartop load carrying device comprises an elongated, hollow tubular member of triangular cross-section formed from a blank of corrugated paper or the like and having its cartop engaging side bowed longitudinally to conform substantially to the curvature of the cartop.

3,606,231
ANCHOR SUPPORT
John Kilborn, 4222 Brott Road, Goodells, Mich. 48027
Filed Oct. 2, 1969, Ser. No. 863,287
Int. Cl. F16f *11/02, 11/04*
U.S. Cl. 248—354S 1 Claim

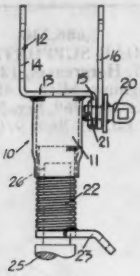


A combined support and guy stabilizer for trailers and the like which provides enhanced stability and security in high winds or other disturbances.

3,606,232
ADJUSTABLE HEAD FOR A FORMWORK PROP
George B. A. Young, Wheaton Aston, England, assignor to Rapid Metal Developments Limited, Birmingham, England
Filed Oct. 31, 1968, Ser. No. 772,162
Claims priority, application Great Britain, Nov. 7, 1967, 50,566/67
Int. Cl. E04g *25/00*
U.S. Cl. 248—357 1 Claim

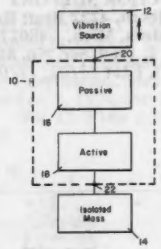
An adjustable head for a formwork prop for use in the casting of concrete slabs comprises a body in screw-threaded engagement with a member for rotatable en-

gagement with the upper end of the prop. The body includes a channel one side of which can be pivoted to a



position clear of the web of the channel to permit removal of a beam supported thereby.

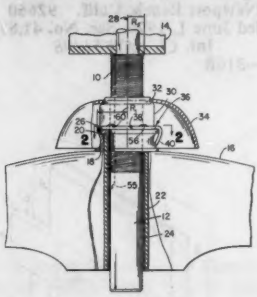
3,606,233
VIBRATION ISOLATION SYSTEM
Terry D. Scharton, Santa Monica, and David A. Bies, Woodland Hills, Calif., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.
Filed Apr. 22, 1968, Ser. No. 723,186
Int. Cl. F16f *15/04*
U.S. Cl. 248—358 **14 Claims**



A vibration isolation system for mechanically coupling a mass to a source of vibratory energy, while reducing transmissibility of the vibrating energy to the mass. The system is a hybrid device, combining both passive and active isolation apparatus for producing isolation over a prescribed frequency range of the generated vibrations, while permitting the mass to be rigidly coupled to the source for frequencies below the isolation range. The hybrid system has particular application in a helicopter to couple the fuselage to the rotor, producing isolation with respect to vibrations above the helicopter control frequency range.

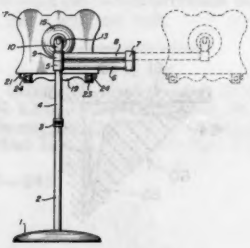
3,606,234
RELEASABLE SWIVEL CHAIR SUPPORT CONSTRUCTION
Robert W. Prescott, Lunenburg, Mass., assignor to Collier-Keyworth Company, Gardner, Mass.
Filed Feb. 24, 1970, Ser. No. 13,534
Int. Cl. F16m *13/00*
U.S. Cl. 248—406 **7 Claims**

A swivel chair support construction employs a spindle with one end adapted to be attached to a chair seat and a portion of the spindle being threaded for a sufficient distance to provide vertical adjustability over the position of the chair to the desired extent, a tubular member receiving the spindle in loose sliding engagement and adapted to be secured to a chair base and including a load bearing element, a load supporting nut threadedly engaged on the spindle, and means for releasably connecting together the spindle and tubular member to prevent axial separation thereof when the chair is lifted. The means includes a hook having an arcuate portion extending around at least a major portion of the periphery of the spindle adjacent the tubular member and an arm fixed to and



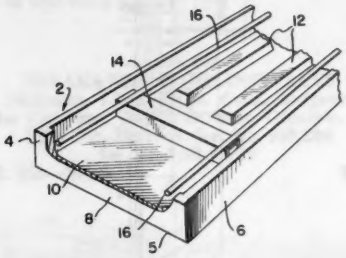
extending from the hook toward the tubular member and terminating in a free end which is arranged to be free from engagement with the tubular member when the hook is cocked in one direction on the spindle to displace the free end of the arm away from the spindle and to engage a portion of the tubular member to prevent separation of the hook from the tubular member when the hook is cocked in the opposite direction on the spindle.

3,606,235
BOOK HOLDERS
Joseph C. Young, Santa Rosa, Calif. (6022 W. 8th St., Apt. 3, Los Angeles, Calif. 90036)
Filed Oct. 2, 1968, Ser. No. 764,985
Int. Cl. A47b *23/04, 23/06*
U.S. Cl. 248—453 **3 Claims**



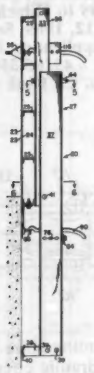
A book holder comprising in combination a floor base, a vertically adjustable standard secured to said floor base, an extendable, horizontal arm pivotally connected to the upper, adjustable end of said standard to swing laterally, a book support means pivotally attached to the outer end of said horizontal arm to swing laterally, a page holding means pivotally attached to said book support means which is optionally useable, and a universally adjustable lighting means, preferably of the high intensity type, attached to said book support means. The book holder being capable of obscurely supporting an electric cord within it.

3,606,236
STAIR TREAD MOLD
Glen A. Seegers, Lombard, Ill., assignor to American Stair Corporation, Inc., McCook, Ill.
Original application Jan. 31, 1968, Ser. No. 701,991, now Patent No. 3,498,012, dated Mar. 3, 1970. Divided and this application Sept. 17, 1969, Ser. No. 885,240
Int. Cl. B28b 7/22
U.S. Cl. 249—14 3 Claims



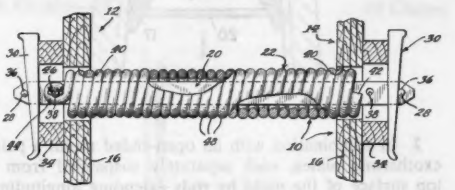
The application is directed to structures and methods for producing pre-formed stair treads which are readily assemblable into complete stair units. The stairs are produced utilizing a mold designed to minimize the weight of individual stair treads, to reinforce such treads, and to provide them with an essentially integral locking device for connecting each of the treads to a riser assembly. Each prefabricated stair tread is reinforced and of a minimum weight and is ready for installation in a variety of stair unit environments. The stair tread locking devices employed are connected to a tread in a manner permitting their movement on the underside of the tread to obtain proper alignment of locking device with a particular riser element and permitting the removal of a locking device from the stair tread when necessary. A number of stair treads can be connected in ascending or descending relationship to a combination of stringers and interconnected risers.

3,606,237
ANCHORING DEVICE FOR VERTICALLY RAISING FORMS
Billy R. Stephens, San Antonio, Tex., assignor to Advance Construction Equipment, Inc., New Braunfels, Tex.
Filed Oct. 13, 1967, Ser. No. 675,218
Int. Cl. E04g 11/22
U.S. Cl. 249—20 14 Claims



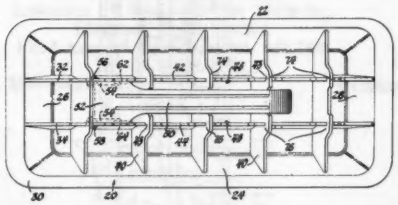
A center passing toggle assembly connected to a form structure, said toggle assembly coacting with at least one anchoring device embedded in concrete to restrain concrete pressure and permit intermittent raising of the said form structure.

3,606,238
TIE ROD ASSEMBLY WITH REUSEABLE TIE ROD PROPER
James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed May 2, 1969, Ser. No. 821,379
Int. Cl. E04g 17/06
U.S. Cl. 249—40 2 Claims



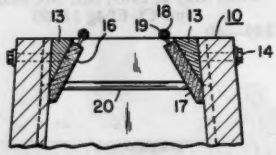
A tie rod assembly for maintaining the opposite sides of a concrete wall form in spaced relationship and including a tie rod proper and a closely wound helical coil formed of soft wire, the coil encircling the medial region of the tie rod proper and spanning the distance between the form sides. After the poured concrete has become set and the form sides removed, the tie rod may be slid endwise from the surrounding concrete embedded coil for reuse in a succeeding concrete wall form installation, while the coil may be extracted from the open-ended transverse bore which it creates by progressively pulling the soft wire endwise from the bore, thus unwinding the coil. By using cylindrical wire stock for the coil, a contour-type screw thread pattern is imparted to the wall of the bore in the concrete wall.

3,606,239
FREEZING GRID WITH CAM LIFT
Joe P. Pietrzak, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 19, 1970, Ser. No. 20,937
Int. Cl. B28b 7/10; B29c 1/00
U.S. Cl. 249—72 8 Claims



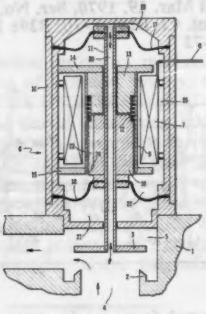
In the preferred form, an ice tray grid has fore and aft movable transverse walls on opposite sides of a pair of lower longitudinal walls which are actuated for ice ejection by being connected with a pair of longitudinally movable upper operating members slidable on the lower longitudinal walls. In each opposite end of the top of each of the lower longitudinal walls is a curved ramp recess, and a cooperating curved cam projection is provided in the bottom of each end of each of the operating members. These projections and recesses are nested in the normal freezing position and cam to lift the operating members and the transverse walls in conjunction with the relative movement from the initial freezing position to the ejecting position.

3,606,240
INGOT MOLD WITH EXOTHERMIC SIDE BOARDS
Roy E. Ferree, Valencia, Pa., assignor to The Susquehanna Corporation
Filed Feb. 10, 1961, Ser. No. 88,442
Int. Cl. B22d 7/10
U.S. Cl. 249—106 2 Claims



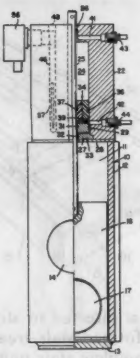
2. In combination with an open-ended mold, a pair of exothermic plates, each separately suspended from the top surface of the mold by rods extending longitudinally above said plates and resting on top of said mold, said plates extending into the mold cavity in spaced relationship to each other; a separate device located between and engaging each said plate and the side wall of the mold; and means located between and engaging said plates and holding each plate in an inclined position with its lower edge engaging said side wall and its upper edge spaced therefrom.

3,606,241
HYDRAULICALLY DAMPED MAGNETIC VALVE
Siegfred Bornholdt, Lohr, Germany, assignor to Danfoss A/S, Nordborg, Denmark
Filed June 3, 1969, Ser. No. 832,038
Claims priority, application Germany, May 4, 1968, P 17 50 470.0
Int. Cl. F16k 31/06
U.S. Cl. 251—52 6 Claims



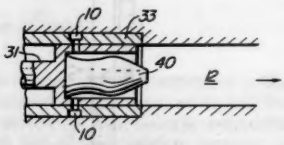
The invention relates to a hydraulically damped magnetic valve having an oil chamber in which the armature and coil are enclosed. The oil chamber is formed by diaphragms attached to the valve spindle, at opposite ends of the armature, and to the interior wall of the housing. Two gas chambers are formed interiorly of the housing on opposite sides of the oil chamber. A passage is formed in the valve spindle which extends from the valve chamber to one of the gas chambers to effect balancing which is concomitant with low closing spring forces.

3,606,242
GATE VALVE WITH HYDRAULIC OPERATOR
Francis M. Lathrop II, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.
Filed Apr. 8, 1970, Ser. No. 26,614
Int. Cl. F16k 37/00
U.S. Cl. 251—62 3 Claims



A gate valve consisting of a body having aligned flow passages and a valve gate within the body which is movable between open and closed positions. A block of nonmagnetic material (e.g., aluminum) is mounted on one end of the body and is provided with a central bore forming a cylinder. One or more additional smaller bores are formed in the block and serve to accommodate magnetically operated electrical switches. A rod connects with the gate and extends axially through the cylindrical bore. A piston is mounted on the rod and is sealed with respect to the surface of the bore. Both end portions of the bore are closed and are adapted to be connected with the hydraulic system for moving the piston in opposite directions whereby the gate is moved between full open and closed positions. A permanent magnet is mounted upon the piston and acts through the adjacent walls of the cylindrical bore to operate the switches.

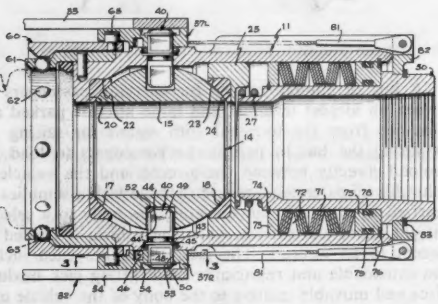
3,606,243
DEVICE FOR PREVENTING NOISE IN AN OIL-HYDRAULIC ELEVATOR
Ken Ichiryu, Hitachi-shi, Humio Hujisawa, Mito-shi, and Mitsuaki Takenoshita and Hiroshi Yumino, Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sept. 12, 1969, Ser. No. 857,419
Claims priority, application Japan, Sept. 13, 1968, 43/65,559
Int. Cl. F16k 47/02
U.S. Cl. 251—118 7 Claims



A device for preventing noise in an oil-hydraulic elevator having an oil-hydraulic circuit including a rotary oil flow control valve comprising a rotary spool in the shape of a cylinder rotatably received in a sleeve, said spool and sleeve each having a pair of oppositely arranged openings adapted to define a pair of oppositely arranged valve

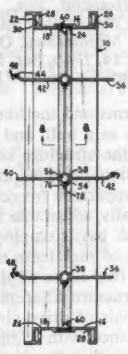
ports when said spool is positioned at a proper angular position with respect to said sleeve, said valve ports allowing two oil jets opposing to each other, the method being characterized by preventing cavitation at an outlet region of said valve ports due to collision of said two jets by keeping the oil pressure at said region in a range of 0.5–5 kg./cm.^{2}. Such an oil pressure in said region is kept by providing a bullet-shaped guide member or a baffle plate at said region or throttling and exhaust passage in the down stream of said valve ports.

3,606,244
BREAKAWAY COUPLING VALVE
Henry Nusbaum, Los Angeles, Calif., assignor to The Rucker Company, Roylyn Division, Glendale, Calif.
Filed Oct. 24, 1969, Ser. No. 869,204
Int. Cl. F16l *37/28*
U.S. Cl. 251—149.9 **9 Claims**



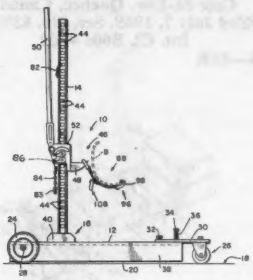
The application discloses a valve body embodying coupling means at one end for detachably connecting it to a nipple or the like, a valve member, a manually operable common actuator means for the valve and the coupling means for operating these in sequence, together with a spring-loaded breakaway mechanism for operating the actuator means when the device is subjected to a predetermined axial load.

3,606,245
CONTROL DAMPER
William A. Reichow and Thomas D. Hill, Kansas City, and James R. Root, Independence, Mo., assignors to Ruskin Manufacturing Company, Grandview, Mo.
Filed June 30, 1969, Ser. No. 837,465
Int. Cl. F16k *1/226*
U.S. Cl. 251—306 **5 Claims**



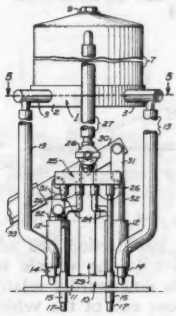
A damper having a rectangular frame provided with a longitudinal groove in each frame side member. A pivoted blade has tubular, cylindrical hubs extending into the grooves and a seal in each groove is configured to sealingly engage the arcuate outer surface of a corresponding hub throughout the movement of the blades to insure adequate sealing between the frame and blade when the latter is in its blocking position.

3,606,246
JACK ASSEMBLY
Chester P. Harrah, Bloomfield, Ind., assignor to The Bloomfield Manufacturing Co., Inc., Bloomfield, Ind.
Filed July 2, 1969, Ser. No. 838,624
Int. Cl. B60p *1/00*; B66f *1/04*
U.S. Cl. 254—2B **16 Claims**



A jack assembly comprising a platform, a jack standard rigidly connected to the platform and extending vertically upwardly therefrom, a lever-actuable lift frame arranged for vertical reciprocation on the standard, and wheel means for movably supporting the platform. The wheel means are preferably arranged yieldingly to support the bottom of the platform slightly above and out of contact with the surface on which the assembly is supported. A flexible lifting strap providing a pair of spaced apart hook-type fingers for engaging work is provided for connection with the lifting frame. A rigid sleeve is disposed telescopically over the upper end of the standard to rest directly on an upwardly and horizontally extending surface provided by the lift frame, which surface extends about the standard.

3,606,247
LEVELER FOR TRAILERS
Lawrence I. Liston, 4107 W. 176th St., Torrance, Calif. 90504
Filed Aug. 25, 1969, Ser. No. 852,768
Int. Cl. B60s *9/02*
U.S. Cl. 254—86H **4 Claims**



A leveler for trailers wherein four simultaneously operated pumps of equal capacity supply hydraulic fluid to four hydraulic leveling jacks mounted at the corners of

the trailer. Hydraulic fluid is supplied to the pumps from a common reservoir through a level sensor mounted on the trailer in such a manner that when the sensor is level, the trailer is likewise level, the sensor having a central downwardly directed inlet and four upwardly open outlets spaced radially from the inlet in correspondence with the jacks, the inlet and the four outlets defining a common plane so that hydraulic fluid is supplied to the lower inlet or inlets and corresponding jacks when the level sensor is tilted, thereby causing the level sensor to seek a level condition.

3,606,248
LIFTING MEANS FOR AUTOMOBILES
George Goldfarb, 5700 Smart Ave., Cote St.-Luc, Quebec, Canada
Filed July 7, 1969, Ser. No. 839,334
Int. Cl. B60s 9/02
U.S. Cl. 254—86R 11 Claims

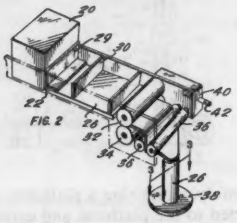
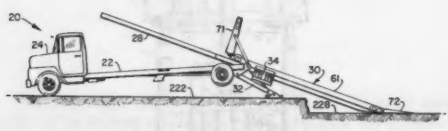


FIG. 2

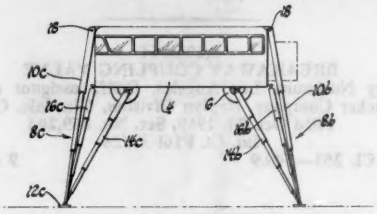
A lifting device such as an automobile jack for displacing an apparatus relative to a given point, the device having a pretempered spring capable of coiling axially on itself when in an unrestrained condition. There are provided means such as guide rollers for flattening a portion of the spring for storage purposes, with drive means such as drive rollers for retracting and advancing the spring from the housing. The end of the spring is preferably provided with a bearing surface such as a metal plate for providing an abutment surface.

3,606,249
VEHICLES
Charles W. Pewthers, 1015 Walton Drive, College Station, Tex. 77840
Original application Nov. 29, 1967, Ser. No. 686,575, now Patent No. 3,485,400, dated Dec. 23, 1969. Divided and this application July 17, 1969, Ser. No. 862,560
Int. Cl. B60s 9/02
U.S. Cl. 254—86H 8 Claims



A vehicle with multisection bed which is extendible and tiltable relative to the vehicle frame and a foot assembly pivotable downwardly relative to the vehicle frame to elevate one end of the vehicle. Fluid-operated motors effect the tilting of the bed and the movement of the foot assembly; and a fluid-operated motor-flexible link arrangement is provided to extend and retract the bed.

3,606,250
GROUND TRANSPORT VEHICLE FOR AIRCRAFT PASSENGERS
Clarence A. Sherman, Birmingham, Mich., assignor to Benton Corporation, Troy, Mich.
Filed Dec. 12, 1969, Ser. No. 884,662
Int. Cl. B60s 9/02
U.S. Cl. 254—86 10 Claims

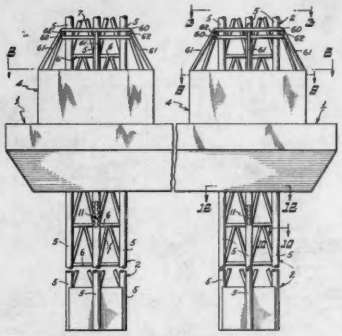


A bus or similar vehicle for carrying passengers between an airport terminal and large aircraft parked at a distance from the terminal with means for raising and lowering the bus to permit the passengers to load and unload directly between the aircraft and the vehicle. A plurality of extendable and retractable jack assemblies are carried by the body for elevating the body to a selected height above the surface when the vehicle is parked adjacent to an aircraft. The jack assemblies each include an extendable and retractable main lifting jack having a free end movable relative to the body of the vehicle upon extension and retraction of the main lifting jack with a surface engaging member secured to the free end of the main lifting jack, and extendable and retractable stabilizing jacks. The stabilizing jacks extend at an angle from the surface engaging member with respect to the main lifting jack when the jack assemblies are extended to provide diagonal bracing of the main lifting jack. All of the jack assemblies are actuated simultaneously between their extended and retracted positions by a power system including proportioning means operable to proportion the flow of hydraulic fluid to and from the individual jack assemblies to control the rate of extension and retraction of the individual jacks and maintain the body in a level attitude.

3,606,251
LEG SUPPORTED OFFSHORE STRUCTURE WITH JACKING APPARATUS
Herbert L. Willke, Houston, Tex., and James G. Abraham, Palos Verdes Peninsula, Calif., assignors to Armco Steel Corporation, Middletown, Ohio
Filed Nov. 14, 1969, Ser. No. 876,781
Int. Cl. B66f 7/12
U.S. Cl. 254—89 16 Claims

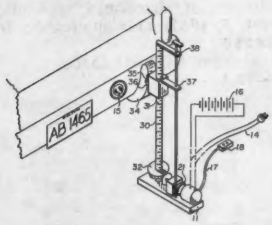
In offshore platforms and the like of the type comprising a structure, such as a hull, and a plurality of upright legs for supporting the structure on the floor of a body of water, the invention provides an improved rack-and-pinion type jacking apparatus for connecting the structure to the legs in vertically adjustable fashion. For each leg, at least one dual rack bar is employed, the rack bar having two opposed sets of rack teeth each extending along a different one of the two edges of the bar. A jacking unit is mounted on the structure adjacent each rack bar and includes at least one pair of drive pinions with the pinions of the pair each meshed with a different one of the two sets of rack teeth, so that the two pinions are opposed across the rack bar. When the legs each comprise a number of tubular column members, one of the dual rack bars

is provided for each of a plurality of the column members of each leg. Alternatively, when the legs are made up of a single tubular member, one or more of the dual



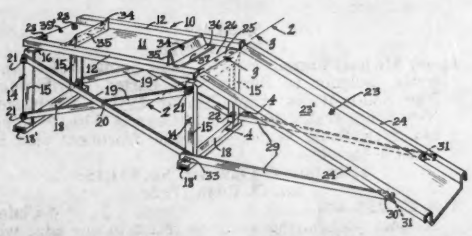
rack bars are secured to the single tubular member of each leg.

3,606,252
PORTABLE ELECTRIC AUTOMOBILE JACK
Joe Dorough, Jr., 2515 Community Drive, Apt. 2003, Dallas, Tex. 75220
Filed July 15, 1969, Ser. No. 841,742
Int. Cl. B66f *3/18*
U.S. Cl. 254—103 **2 Claims**



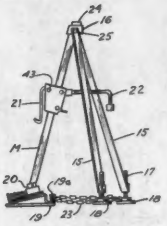
A portable electric automobile jack that raises and lowers the bumper of a vehicle in a smooth continuous motion using electric power produced by the automobile but the structure of which is otherwise independent from the body of the automobile; thereby enabling the jack to be disassembled, transported to other vehicles when needed and stored in the trunk of the automobile.

3,606,253
PORTABLE VEHICLE RACK
Dupree Wooten and Robert Wooten, both of 9401 W. William St., Rosemont, Ill. 60018
Filed Jan. 26, 1970, Ser. No. 5,730
Int. Cl. E02c *3/00*
U.S. Cl. 254—88 **5 Claims**



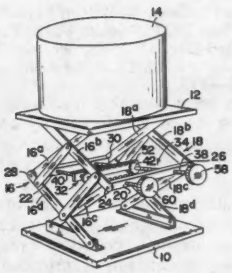
A portable vehicle rack having a platform provided at opposite ends with safety blocks and having an inclined ramp attached to either end of the platform and removable therefrom to permit free access to the underside of the vehicle being serviced or repaired, the rack being capable of being disassembled when not in use to facilitate storage thereof.

3,606,254
VEHICLE BUMPER JACK
Oscar William Olson, 3613 37th Ave., NE., Apt. 306, Minneapolis, Minn. 55421
Filed June 20, 1969, Ser. No. 834,962
Int. Cl. B66f *1/04*
U.S. Cl. 254—111 **8 Claims**



A stable tripod vehicle bumper jack characterized by vertically adjustable rear support legs and a fixed foot movably supporting the jack column to permit variations of the angle of the jack column to compensate for differences due to lifting of the vehicle bumper. The adjustable supporting legs permit the jack to remain stable with the lifting member lying substantially in a vertical plane. The movable support for the lifting member avoids the necessity that the support legs move to compensate for the conventional change in the angle of the lifting member as the vehicle is raised.

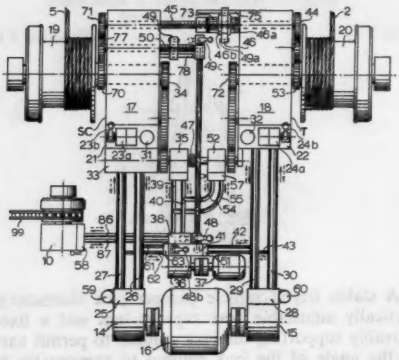
3,606,255
SCISSORS JACK
Gordon C. Stevens, Garfield Heights, Ohio, assignor to The Chemical Rubber Company, Cleveland, Ohio
Filed Aug. 1, 1968, Ser. No. 749,446
Int. Cl. B66f *3/22*
U.S. Cl. 254—122 **3 Claims**



A scissors jack having a load supporting member operative to be raised and lowered by movement of a pair of adjusting arms toward and away from each other, a pair of

threaded rods interconnecting the arms, at spaced points, sprockets mounted on each rod and a chain drivingly interconnecting the sprockets.

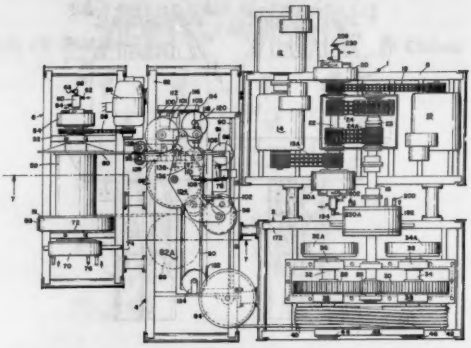
3,606,256
WINCH CONTROL SYSTEMS
Karsten Alfred Ovretveit, 87 Lower Road, Fetcham, Surrey, England
Continuation-in-part of application Ser. No. 608,636, Jan. 11, 1967. This application June 21, 1968, Ser. No. 738,927
Int. Cl. B66d *1/48*
U.S. Cl. 254—172 **6 Claims**



In a cable conveyor system for transfer of cargo between moving objects such as two ships where a loop of wire is slung over a pulley on one ship and the two ends of said wire are slung over independent pulleys on the other ship, where the two wire ends are independently operated by two hydraulic winches having a combined winch control system whereby one winch is used as a tensioning winch and the other is used as a speed and direction control winch, and incorporating feedback systems whereby the acceleration, speed, deceleration and stop position of said container can be predetermined relative to one ship or the other irrespective of the rolling of said two ships.

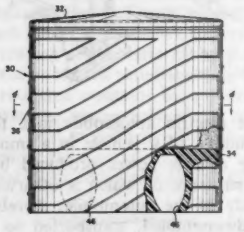
3,606,257
TRACTION DRUM WINCH WHICH EXERTS A PREDETERMINED CONSTANT TENSION ON A CABLE
John Hart Wilson, % Wilson Manufacturing Co., P.O. Box 1031, Wichita Falls, Tex. 76307
Filed Dec. 31, 1968, Ser. No. 788,256
Int. Cl. B66d *1/48*
U.S. Cl. 254—175.7 **4 Claims**

A traction drum winching mechanism utilizing a storage drum on which a substantially constant tension is maintained to reel cable thereonto at a tension less than that which will crush a cable. This enables a cable of large diameter to be wound onto a storage drum without crushing. Water cooled clutches and brakes are provided to enable the clutches and brakes to be slipped continuously over an indefinite period of time without heating, and a sensing mechanism is provided for sensing the weight of the drilling pipe to enable drilling to be continued from a barge, drill ship or vessel, which vessel is being subjected to rise and fall due to waves, while maintaining constant tension on the pipe without the movement of the drill ship or vessel interfering with the drilling of the bore hole. Provision is made to spool the convolutions of cable in side by side relation with a slight



crowd angle, by means of a hydraulically actuated cable spooling device.

3,606,258
ENERGY ABSORBING DECELERATION BARRIERS
John C. Fitch, Lime Rock, Lakeville, Conn., assignor to Fibco, Inc., Hartford, Conn.
Continuation-in-part of abandoned application Ser. No. 665,359, Sept. 5, 1967. This application Jan. 2, 1969, Ser. No. 788,890
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 **9 Claims**

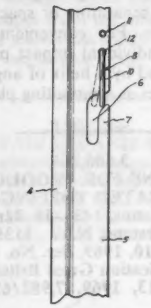


Highway safety devices comprising an array of energy absorbing barrier units each preferably comprising a dispersible mass, effective, when struck by a vehicle, to bring the vehicle to rest at a rate of deceleration tolerable to the vehicle occupants without imposing an overturning or lifting moment on the vehicle.

3,606,259
FENCE POSTS
James Michael Farrell, Walcha, New South Wales, Australia, assignor to Bessie May Larter, Northbridge, New South Wales, Annie Maude Taylor, Leichhardt, New South Wales, and Mabel Margaret Wise, Paddington, New South Wales, Australia, fractional part interest to each
Filed June 6, 1969, Ser. No. 831,155
Int. Cl. E04h *17/24*
U.S. Cl. 256—48 **4 Claims**

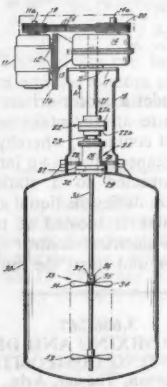
A fence post having a slot or recess in one edge with a keeper to enable easy insertion of the fence wire but resiliently biased to prevent withdrawal thereof. The

keeper is a U-shaped piece of wire with arms of unequal length. Each arm has an end portion which is bent over



toward the other arm and these end portions are inserted into two holes which are drilled through the post.

3,606,260
AGITATOR SEAL CARTRIDGE
Isadore Rubin, South Orange, N.J., assignor to Industrial Process Engineers, Newark, N.J.
Filed Jan. 23, 1969, Ser. No. 793,252
Int. Cl. B01f *7/16*; F16j *15/16*
U.S. Cl. 259—1 **15 Claims**

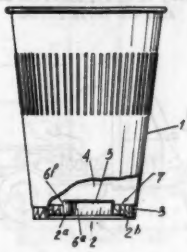


This invention describes a new agitator mechanical seal cartridge assembly which may be rapidly removed for maintenance and replaced by a spare or by itself, after repair, without essentially disturbing the remaining agitator components, such as drives (motors or gear reducers) shaft and impellers. This assembly, while designed for agitators, may be employed with pumps or other machinery using rotating shafts where a seal is required.

3,606,261
PROCESS FOR THE CONTINUOUS CONTROL OF HOMOGENIZATION OF A MIXTURE OF TWO OR MORE MATERIALS
Zdenek Severa, Prague, and Antonin Benda and Petr Vachalovsky, Roztoky, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Prague, Czechoslovakia
No Drawing. Filed Mar. 12, 1969, Ser. No. 806,716
Int. Cl. B01f *3/00*
U.S. Cl. 259—1R **2 Claims**

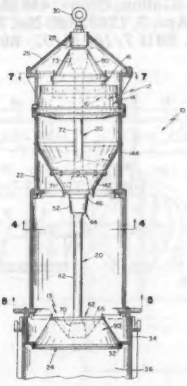
A process for the continuous control of homogenization of a mixture of two or more materials. There is added to a mixture a small amount of a magnetically orientated indicator material in powder form. This indicator material is dispersed into the mixture by the homogenizator. One or more instruments are mounted in the homogenizator for measuring the magnetic field intensity of the mixture. Upon the receiving of an even signal from the measuring instrument, the homogenization process of the mixture is completed.

3,606,262
CUP, MUG OR OTHER DRINKING VESSEL, MORE ESPECIALLY MADE OF PLASTIC
Teunis van't Hoff, Rotterdam, Netherlands, assignor to Impromex A.G., Freibourg, Switzerland
Filed Apr. 1, 1969, Ser. No. 811,908
Claims priority, application Netherlands, Apr. 2, 1968, 6804631
Int. Cl. B01f *3/00*
U.S. Cl. 259—1 **6 Claims**



In a cup, mug or similar drinking vessel, having directly in the cup wall a series of inward projections, teeth or cams, which protrude into the cup cavity in order to facilitate and promote the mixing of ingredients fed to the cup cavity, a raised portion of the bottom faces with its upright side wall parts these wall projections, teeth or cams concavely in order to increase the whirling effect exerted thereby on the mixture ingredients and to thereby ameliorate the taste of the mixture.

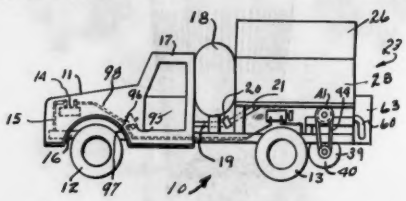
3,606,263
FORCE DISTRIBUTING STRUCTURE
Caperton B. Horsley, East Walpole, Mass., assignor to Braxton Corporation, Medfield, Mass.
Filed Oct. 8, 1969, Ser. No. 864,751
Int. Cl. B01f *11/02*
U.S. Cl. 259—1 **14 Claims**



A force distributing structure comprising: a distribution cone having an apical portion for receiving a concentrated axial force applied interior to the distribution cone and a basal edge; a first truncated cone, having a truncated edge and a basal edge, concentric with and opening in the

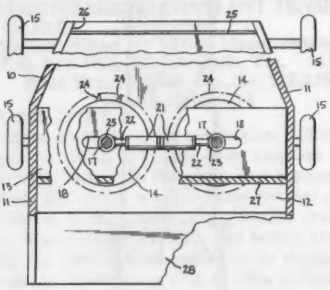
opposite direction from the distributing cone and having its truncated edge attached to the basal edge of the distribution cone; structure providing an extended surface to which the axial force is distributed which is of greater area than the cross sectional area of the apical portion, the surface being supported by the basal edge of the first truncated cone; and, a second truncated cone, having a truncated and a basal edge, concentric with and opening in the same direction as the distribution cone and having its truncated edge attached to and supporting the surface.

3,606,264
MARKING MEANS UTILIZING COLORED LIQUID AT THE EDGE OF A STRIP IN AN OPEN FIELD OR COUNTRY
Clifford L. Rosselot, P.O. Box 183, Owensville, Ohio. 45160
Filed May 7, 1969, Ser. No. 822,434
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 4 Claims



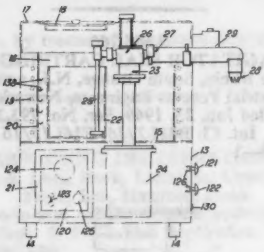
The strip marker of the present invention effects the marking of a strip in an open field or land that is being treated by insecticides, fertilizing material, or the like and wherein said field edge markings are by means of a colored liquid that is readily distinguishable from a distance, the said marking mechanism is adapted to be attached to the land strip conditioner and which is generally a self-contained and self-propelled truck and from the power mechanism of the truck or tractor the said field marker is operated. This field marker while marking by colored liquid is not a continuous strip but is merely spots of the said liquid marking material.

3,606,265
FRAGMENTIZING APPARATUS WITH VERTICALLY MOUNTED DRUM
Herbert T. Cobey, R.F.D. 2, Galion, Ohio 44833
Filed Apr. 3, 1969, Ser. No. 813,011
Int. Cl. B01f *7/16, 15/02;* B02c *2/04*
U.S. Cl. 259—8 13 Claims



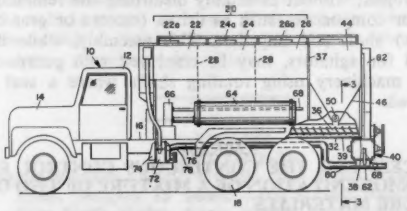
A stationary or mobile fragmentizing apparatus provided with one or more rotors or drums mounted for rotation about a vertical axis and having impact or shearing projections thereon for fragmentizing agricultural or waste materials which are fed to the apparatus. Means are provided for adjusting the spacing between adjacent drums for fragmentization control as well as for providing temporary clearance for the passage of an injurious obstruction. Such drum separating or spacing means can be made load responsive. For convenient and inexpensive replacement of the individual impact projections, a continuous bracket formed by a helix of angle iron is secured to the drum and serves as a mounting plate for the impact projections.

3,606,266
MACHINE FOR PRODUCING AERATED TOPPINGS
John MacManus, 143—16 22nd Road, Whitestone, N.Y. 11357
Filed Dec. 10, 1969, Ser. No. 883,867
Claims priority, application Great Britain, Dec. 31, 1968, 61,986/68; Feb. 13, 1969, 7,982/69; Sept. 5, 1969, 44,032/69
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 34 Claims



The machine includes a motor-driven pump having an inlet connected both to an air intake and to an unpressurized liquid product container, whereby the liquid product and air are simultaneously drawn into the pump. The pump outlet is connected to a static, narrow-orifice homogenizer which emulsifies the liquid and air mixture. A solenoid-operated valve is located at the outlet of the homogenizer and an electrical control system simultaneously opens the valve and starts the motor.

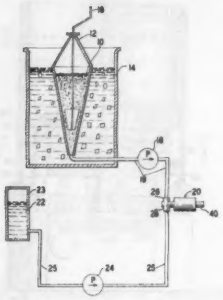
3,606,267
TRUCK FOR MIXING AND DELIVERY OF BLASTING COMPOSITIONS
Donald J. Pederson, Tucson, Ariz., assignor to Hercules Incorporated, Wilmington, Del.
Filed Jan. 22, 1970, Ser. No. 5,071
Int. Cl. B01f *7/08*
U.S. Cl. 259—6 5 Claims



An improved truck for mixing and delivery of ammonium nitrate-fuel oil blasting compositions containing a second solid fuel in addition to the ammonium nitrate is provided. The truck has separate storage tanks and conveyors for the ammonium nitrate, fuel oil and second solid fuel. The conveyors are connected together for simultaneous operation with a hydraulic drive system. The solids are fed through an air lock to a mixing cham-

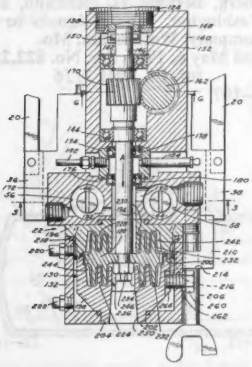
ber where they are mixed with fuel oil and are discharged from the mixing chamber with pneumatic pressure. A vent pipe is connected between the air lock and the solids outlets from the storage tanks and releases pneumatic pressure which escapes from the mixing chamber through the air lock which allows the solids to be fed to the mixing chamber in adjustable and precisely controlled amounts.

3,606,268
MIXING PROCESS AND APPARATUS
Joseph J. Grabauskas, Chicago, Ill., assignor to Union Carbide Corporation
Continuation of application Ser. No. 674,575, Oct. 11, 1967. This application Apr. 29, 1969, Ser. No. 820,716
Int. Cl. B01f *5/08, 7/02*
U.S. Cl. 259—7 **3 Claims**



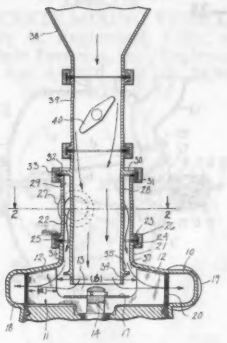
An air-free collagen slurry can be mixed with an air-free swelling agent and the mixture can then be subjected to shearing action to obtain a uniformly swollen collagen dispersion from which collagen structures can be subsequently fabricated.

3,606,269
MIXING DEVICE
Donald E. Trumbull, Sunnyvale, Calif., assignor to Pyles Industries, Inc., Wixom, Mich.
Filed Feb. 10, 1970, Ser. No. 10,142
Int. Cl. B01f *7/16*
U.S. Cl. 259—8 **1 Claim**



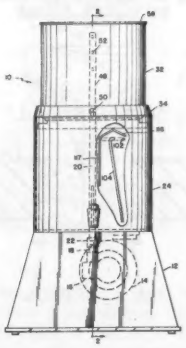
Shown herein a mixing device for receiving plural component flowable materials and mixing them together and dispensing them. A mixer, whose design provides for large face-to-face area of closely spaced relatively moving interrupted surfaces, offsets the otherwise high pressure drop across it by providing a pumping action within the mixer assisting the passage of the components being mixed therethrough. The mixing device further provides for a quick disconnect of the mixer and its associated motor and monitor as an assembly from the remainder of the device to allow flushing of the mixer. Rack and pinion operation of the plural component delivery valves assures simultaneous start and stop of the components' flow.

3,606,270
CONTINUOUS POWER BLENDER
Robert D. Zimmerly, Kenosha, Wis., assignor to Ludish Co., Cudahy, Wis.
Filed May 14, 1970, Ser. No. 37,214
Int. Cl. B01f *7/26*
U.S. Cl. 259—8 **10 Claims**



Particulate material from a hopper is fed through a feed tube into the eye of the impeller of a centrifugal pump and liquid is also directed into the eye by a tube which is concentric with and surrounds the first tube, both materials then traveling through the impeller together, there being a peripheral casing portion surrounding the impeller from which the mixture is discharged tangentially, and there optionally being a central screen surrounding the impeller to insure proper mixing.

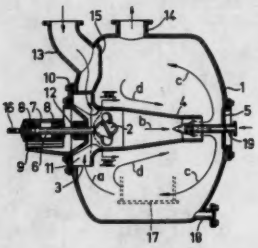
3,606,271
AUTOMATIC MIXER
Robert T. Schmidt, Port Huron, Frederick J. Sicheneder, Washington, and Paul W. Rowe, Bay City, Mich., assignors to Ruffy Research & Engineering, Inc., Detroit, Mich.
Filed Aug. 4, 1969, Ser. No. 847,295
Int. Cl. B01f *7/16*
U.S. Cl. 259—24 **13 Claims**



An automatic mixer is provided for mixing a liquid and powdered material together. The mixer includes a mixing tank and a reservoir for powdered material. The

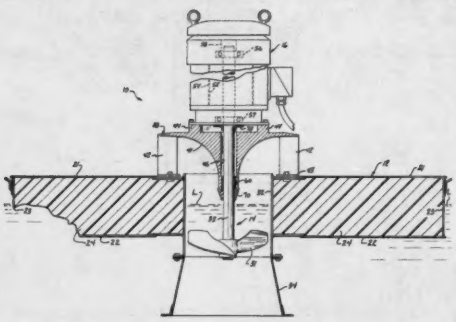
tank is first filled with liquid. Powder in a desired volume is then dispensed into the tank. The contents of the tank are agitated. Electrical circuitry is provided to automate the entire cycle of operation.

3,606,272
MIXING APPARATUS
Karl Erik Bergstedt, Timra, Sweden, assignor to Sunds Aktiebolag, Sundsbruk, Sundsvall, Sweden
Continuation-in-part of application Ser. No. 702,580, Feb. 2, 1968. This application Mar. 23, 1970, Ser. No. 21,878
Claims priority, application Sweden, Feb. 27, 1967, 2,701/67
Int. Cl. B01f *7/02*
U.S. Cl. 259—25 14 Claims



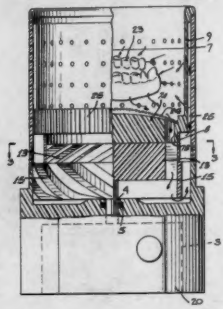
Apparatus for mixing suspensions of materials while admixing additional treating materials therewith in which the suspension is circulated through a sleeve-shaped casing entirely within a container. The treating materials are added to the suspension while it is being impelled through the sleeve-shaped casing. The outlet end of the casing is spaced from the wall of the container which provides a surface for impingement of the treated suspension to provide turbulent mixing thereof.

3,606,273
FLOAT, PUMP AND MOTOR ASSEMBLY
John K. Johnson, Rockford, Ill., assignor to Aqua-Aerobic Systems Inc., Rockford, Ill.
Filed Jan. 15, 1970, Ser. No. 3,074
Int. Cl. B01f *5/12*
U.S. Cl. 259—95 11 Claims



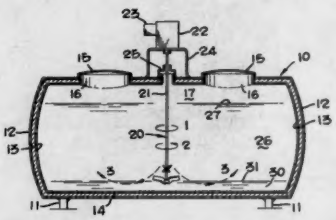
The assembly includes a float, a vertical propeller pump and a motor. Combined radial and thrust bearings are provided at the motor for supporting a one-piece shaft on which the propeller is mounted. The motor is supported on a casting which serves as a diffuser for the liquid pumped. A deflection bearing is mounted on the casting in spaced relation to the shaft and is operative to engage the shaft when it is deflected. A deflector hub is mounted on the shaft and engages the lower end of the deflection bearing to form a seal therewith. The unique shape of the deflector hub is best understood by reference to the drawings.

3,606,274
DENTURE WASHER
Gabriel S. Nelson, Box 133, R.D. 1, Station Road, New Paltz, N.Y. 12561
Filed May 18, 1970, Ser. No. 38,164
Int. Cl. B01f *5/12*
U.S. Cl. 259—95 3 Claims



A denture washer which circulates washing fluid within a hollow denture washing housing. A fluid impeller is mounted at the bottom of the housing having two coaxial impellers including a larger diameter impeller for forcing fluid upwardly into the denture support housing and a smaller impeller for pulling the fluid downwardly. A perforated cylindrical stack or divider is placed in the housing with its lowermost portion positioned intermediate the impellers to separate the respective fluid flows.

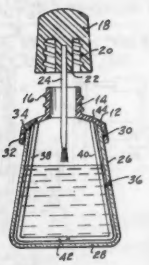
3,606,275
PADDLE ASSEMBLY FOR BULK MILK TANKS
Nathan B. Oberg, Bernard H. Heimann, and Hugo W. Holtmeier, Washington, Mo., assignors to Zero Manufacturing Company, Washington, Mo.
Filed May 6, 1969, Ser. No. 822,250
Int. Cl. B01f *7/16*
U.S. Cl. 259—107 4 Claims



This cooling and cleaning system provides a paddle assembly performing both the cleaning and cooling functions in a bulk milk tank. The paddle assembly includes a shaft depending from a variable speed, reversible drive means. Upper and lower paddles are provided at the remote end of the shaft to provide the circulating action

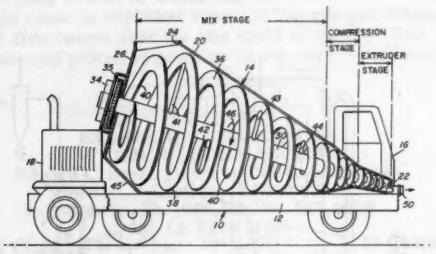
at a relatively slow rotational speed during the cooling cycle. The lower paddle includes spatter blades immersible in a cleaning fluid when the tank is empty of milk, the spatter blades benig rotatable at a relatively high speed in a reverse direction during the cleaning cycle.

3,606,276
CONTAINER WITH AGITATOR
Sylvia Jackson, Atlanta, Ga., assignor to Product Development and Market Consultants, Inc., Jefferson Parish, La.
Filed Oct. 23, 1968, Ser. No. 770,019
Int. Cl. B01f 7/16
U.S. Cl. 259—108 **10 Claims**



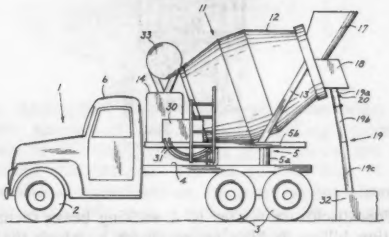
A container for a suspension of particles in which an agitator disposed adjacent the container base agitates and returns to the suspension settled particles of pigment in response to relative rotation between upper and lower parts of the container which have been assembled with an airtight seal. One of the two parts of the container carries a removable lid or cap providing a one-time airtight factory seal for the dispensing opening. The arrangement is such that the container parts may be relatively rotated to agitate the suspension without destroying the factory seal.

3,606,277
TRANSIT-MIX CONCRETE TRUCK
Brahim Ijac Kader, 3724 Norman Bridge Road, Montgomery, Ala. 36108
Filed Sept. 22, 1969, Ser. No. 859,821
Int. Cl. B28c 7/16
U.S. Cl. 259—169 **17 Claims**



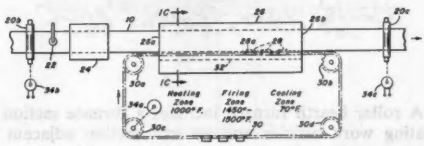
A transit-mix concrete truck is disclosed which utilizes a stationary mixing drum in which is located a rotatable conical helix screw. The screw is coaxial with the drum and has substantially the same diameter as the inner diameter of the drum, with the screw and the drum both being tapered to form truncated cones. The screw is constructed in three stages, the first stage having a large average diameter and coarse pitch for mixing concrete. This large diameter screw tapers toward the second stage which is of smaller average diameter and finer pitch to compress concrete during delivery. The third stage, which is smallest in diameter and finest in pitch, serves as an extrusion stage which provides sufficient pressure to extrude concrete through an orifice and into a delivery line. Rotation of the spiral screw in one direction causes the concrete to move toward the rear of the drum, forcing it to spill over the inner edges of the screw for mixing and agitating. Rotation of the screw in the opposite direction causes the concrete to be moved into the compression and extrusion stages at the front of the drum for subsequent conveyance under pressure to a suitable distribution head.

3,606,278
CONCRETE MIXING VEHICLE
Robley Winfrey II, Englewood, Colo., assignor to Rocky Mountain Prestress, Inc., Englewood, Colo.
Filed Apr. 9, 1970, Ser. No. 26,963
Int. Cl. B28c 7/16
U.S. Cl. 259—172 **11 Claims**



A concrete mixing vehicle having a hopper assembly movably mounted on the vehicle body is disclosed. A discharge chute which projects downward in a substantially vertical direction is mounted on the hopper assembly for receiving and channeling concrete discharged therefrom. Hydraulic means are disclosed for selectively positioning the hopper assembly relative to the vehicle body whereby to position the discharge portion of the hopper assembly so as to determine the location at which concrete is poured.

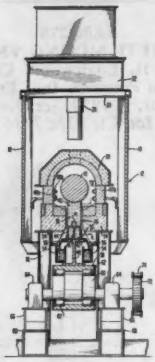
3,606,279
APPARATUS FOR HEAT TREATING A SHEET
Robert G. Auger, Monroeville, Pa., assignor to United States Steel Corporation
Filed Oct. 8, 1969, Ser. No. 864,680
Int. Cl. F27b 9/28
U.S. Cl. 263—3 **14 Claims**



Apparatus for heat treating a sheet while disposed at a substantially vertical plane without contacting opposite treated sides of the sheet is disclosed. The apparatus has a furnace for heat treating the sheet, positioning means adjacent the furnace in engagement with the sheet for positioning the sheet in the substantially vertical plane, supporting means in the furnace in engagement with the bottom of the sheet for guiding the sheet through the

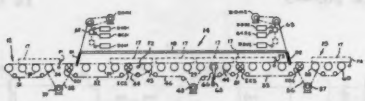
furnace and drive means connected to one of the positioning means and the supporting means for moving the sheet through the furnace.

3,606,280
WALKING BEAM FURNACE CONSTRUCTION
Charles B. Gentry, Grand Rapids, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.
Filed Nov. 14, 1969, Ser. No. 876,666
Int. Cl. F27b *9/14*
U.S. Cl. 263—6A 7 Claims



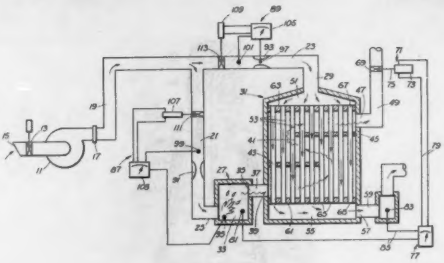
This disclosure relates to a walking beam furnace for heating billets to high temperatures in which the billets are supported at the sides of the walking beam by spaced, removable refractory blocks. Metal caps are placed on the corners of the refractory blocks to reduce wear on the corners as a result of continued contact with the billets during their movement through the furnace. Sloping surfaces are formed between the refractory blocks to facilitate the enveloping of the billets with a high heat intensity flame while the billets are supported by the refractory blocks.

3,606,281
ROLLER HEARTH FURNACE WITH ROLL OSCILLATION CONTROLLER
Talmadge F. Price and Robert R. Walton, Shelbyville, Ind., assignors to General Electric Company
Filed May 22, 1970, Ser. No. 39,725
Int. Cl. B27b *4/14*
U.S. Cl. 263—6C 17 Claims



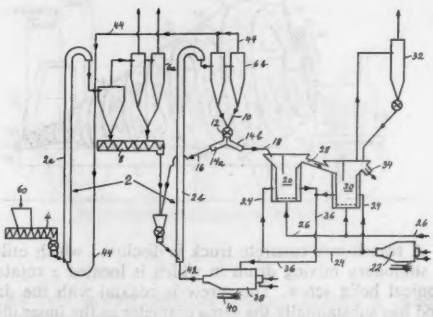
A roller hearth furnace includes a furnace section for heating work articles and an exit section adjacent the furnace section for receiving heated articles from the furnace section. The articles are supported by a plurality of spaced parallel rotatable rolls with the rolls in the furnace section being rotated by a reversible electric motor. A roll oscillation controller is provided for automatically reversing the direction of rotation of the motor each time one of the rolls rotates through a complete revolution to thereby oscillate the rolls for oscillating articles back and forth in the furnace section. Means are provided for operating the oscillation controller either manually or automatically, the automatic operation being in response to arrival of an article at a position in the furnace section near its exit end while an article is positioned in the exit section so as to prevent a jam of articles.

3,606,282
HIGH TEMPERATURE HEAT EXCHANGER AND METHOD OF OPERATING
Kenneth W. Stookey, Markle, Ind., assignor to Torrax Systems, Inc., North Tonawanda, N.Y.
Filed May 6, 1970, Ser. No. 34,960
Int. Cl. F23l *15/04*
U.S. Cl. 263—20 15 Claims



A heat exchanger of the refractory tube type is provided with pressure control means whereby the entire heat exchanger system is operable at high pressures without detrimental effects by maintaining a low predetermined pressure differential across the walls of the heat exchanger tubes. Control means are provided to regulate the flow of the hot gases through the system and adjust the pressure thereof in response to changes in the pressure of the gases or fluid in opposite sides of the system.

3,606,283
PROCESS FOR THE CONVERSION OF HYDRATED HALIDES INTO ANHYDROUS SALTS AND APPARATUS THEREFOR
Wilhelm Georg Weber, Pratteln, Switzerland, assignor to Buss A.G., Basel, Switzerland
Filed July 23, 1969, Ser. No. 844,042
Claims priority, application Switzerland, July 31, 1968, 11,732/68
Int. Cl. F27b *15/00*
U.S. Cl. 263—21A 9 Claims



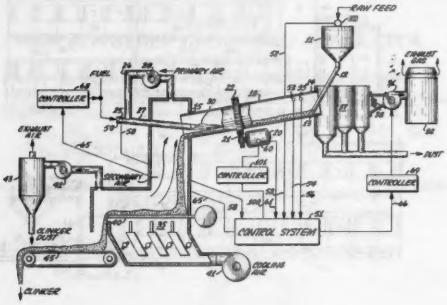
A process for the continuous conversion of hydrated halides into anhydrous salts, which comprises pre-calcining the moist hydrate in a first step by heating it with

vigorous agitation to a temperature at which the total surface moisture and part of the crystal water are removed, and thereafter further heating the pre-calcined salt in stepwise operation in a gently moving layer until the temperature for complete calcination is reached. For bringing about the moving action, dry gas is introduced into the layer of pre-calcined salt while it is being further heated for complete calcination, said gas also serving for entraining the steam formed during the drying process. The invention further relates to an apparatus for carrying out the calcination.

3,606,284
METHOD AND APPARATUS FOR CEMENT KILN CONTROL

Myron Robert Hurlbut, Peabody, Mass., and James William Lane, Houston, Tex., assignors to General Electric Company

Filed Sept. 26, 1969, Ser. No. 861,423
Int. Cl. F27b *7/00*
U.S. Cl. 263—32 **13 Claims**



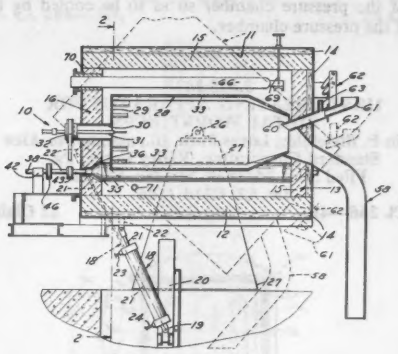
A method and apparatus for improving the control of a rotary cement kiln wherein the fuel rate set point and the exit gas rate set point are normally controlled. During a normal range of kiln disturbances, the control of fuel rate set point is based upon kiln drive motor torque measurements in conjunction with feedback signals generated by a dynamic kiln model which stores a record of past control actions. Control of the exit gas rate set point is based upon measurements of gas temperature at a selected intermediate area of the kiln. Oxygen content of the exit gas is monitored and employed to exercise overriding control to insure that no combustibles which might cause an explosion appear in the exit gas. Abnormal disturbances alter the kiln speed to thereby effect a more rapid process response to the abnormal disturbance.

3,606,285
BARREL-TYPE BATCH GAS CARBURIZING FURNACE

Edward C. Bayer, Dearborn, Mich., assignor to Holcroft & Company, Livonia, Mich.

Filed Oct. 20, 1969, Ser. No. 867,460
Int. Cl. F27b *7/08*
U.S. Cl. 263—34 **19 Claims**

A rotary barrel-type retort is positively driven, along with a pair of elongated supporting rollers cradling the same, by drive means disposed in the entirety thereof externally of a cylindrical furnace heating chamber in which the retort is concentrically located for rotation. Part loading and unloading chute components are at the same axial end of the heating chamber, with the retort being rotatively supported in part, in supplementation of its cradling support rollers, by a trunnion at the opposite axial end of the heating chamber. Means for rotating the retort are associated with the trunnion, in common with means for rotating the retort-supporting rollers; and in each case the retort and roller drive means are entirely external of the hot heating chamber. In one embodiment of the furnace direct firing gas burners discharge products of combustion into the heating chamber in a direction generally tangential of the retort. In another embodiment, U-type radiant heaters are em-

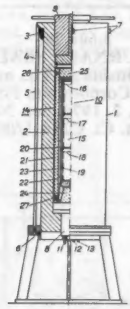


ployed. Atmosphere gas is introduced to the retort via an inlet passage in the retort journalling trunnion, emerging at the other retort end and flowing into the combustion chamber then out the furnace flues. A gas inlet is also contemplated in the part loading chute at a heating chamber end, supplementing the supply of atmosphere gas through the retort trunnion.

3,606,286
FURNACE FOR HEAT TREATING OBJECTS UNDER HIGH PRESSURE

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Electriska Aktiebolaget, Vasteras, Sweden

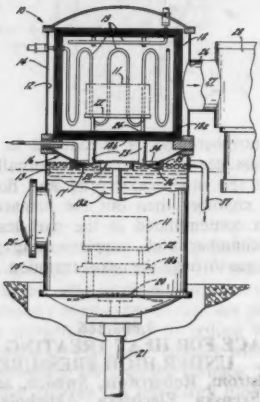
Filed Sept. 15, 1969, Ser. No. 857,752
Claims priority, application Sweden, Sept. 18, 1968, 12,545/68
Int. Cl. F27b *5/00*
U.S. Cl. 263—40 **15 Claims**



A cylindrical furnace for treating material at high temperature in a gaseous atmosphere under high pressure includes a pressure chamber and an insulating hollow body arranged inside the pressure chamber with a space therebetween. The insulating body includes a cylindrical sheath having an insulating lid and bottom sealing its ends. A furnace chamber is arranged within the insulating hollow body. Connections are provided near the top

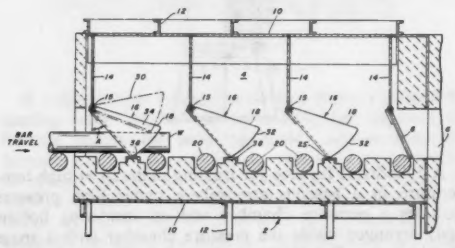
and bottom of the furnace chamber between the furnace chamber and the space. An arrangement is also provided for normally obstructing through-flow through at least one of these connections. This member can be opened, for example by melting a part of it, by a flow of electrical current or destroying such a part by an explosion, so as to permit gas influenced by pressure differences due to the temperature difference to flow out of the furnace chamber and down between the hollow body and the wall of the pressure chamber so as to be cooled by the wall of the pressure chamber.

3,606,287
HEAT TREATING APPARATUS FOR METAL WORKPIECES
Irvin P. Bielefeldt, Loves Park, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.
Filed Nov. 24, 1969, Ser. No. 879,168
Int. Cl. C21d *1/66*
U.S. Cl. 266—4R **12 Claims**



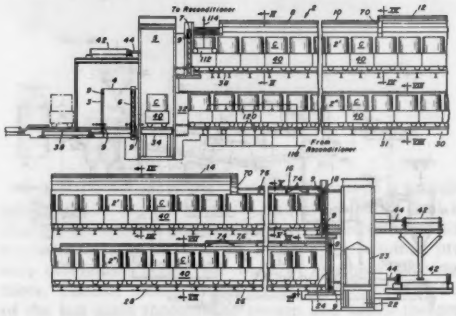
A seal of frozen quenching liquid is formed in a heat treating apparatus between the sealing surfaces of a flange defining an opening in a heating chamber and a closure member for blocking the opening, the seal being gastight so that the atmosphere within the chamber can be controlled.

3,606,288
FURNACE SEAL
William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Feb. 2, 1970, Ser. No. 7,721
Int. Cl. C21d *1/00*
U.S. Cl. 266—5R **10 Claims**



A sealing system for a furnace, such as a continuous bar annealing furnace having a plurality of sealing elements supported across the opening to the furnace in a side-by-side relationship. Each element of the seal has two parallel planar sides in alignment with the direction of entry into the furnace. Material entering the furnace contacts one or more elements causing them to be displaced, permitting the material to enter the furnace. The dimension of the planar sides of each element in the direction of displacement is of such magnitude that the side of one element remains in a continually overlapping relationship with the side of an adjacent element when one of the elements is displaced by the material entering the furnace.

3,606,289
APPARATUS FOR ANNEALING STEEL COILS
William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.
Filed Feb. 26, 1969, Ser. No. 802,548
Int. Cl. C21d *1/00*
U.S. Cl. 266—5R **15 Claims**



A furnace for annealing whole coils of silicon steel which includes a welded gas tight shell lined with varying thickness refractory material defining a plurality of independently controllable heating and cooling zones and in which a hydrogen atmosphere is maintained; the furnace having cars of special design for transporting the coils therethrough, special heating elements extending along the furnace walls of the heating zone and a supplemental cooling arrangement for the coils to provide a controlled heat treatment.

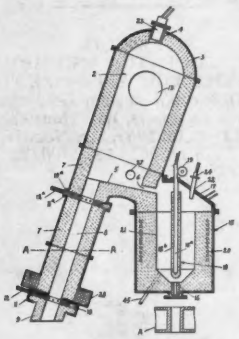
3,606,290
APPARATUS FOR THE PRECIPITATION OF METALS FROM SOLUTION
Nealand Lynn Ransom, Chuquicamata, Chile, assignor to Kennecott Copper Corporation, New York, N.Y.
Original application Jan. 23, 1967, Ser. No. 610,946. Divided and this application Sept. 10, 1969, Ser. No. 870,973
Int. Cl. C22b *3/02*
U.S. Cl. 266—22 **7 Claims**

Apparatus for precipitating metal values from solution on massed descrete pieces of solid precipitant. A precipitation vessel of inverted conical formation is charged with the precipitant, and the pregnant solution containing the metal values is injected under pressure into the mass of precipitant through a nozzle located at the downwardly-directed apex of the vessel. The nozzle is of special formation comprising an outwardly divergent channel member of conical formation inset into a discharge orifice to provide an annular nozzle opening concentrically surrounding a central nozzle opening. The force of the incoming solution creates a void in the mass of precipitant immediately above the nozzle, and, as pieces of partially consumed precipitant fall into the

void above the nozzle, their surfaces are scrubbed clean of adherent precipitate which is carried upwardly by

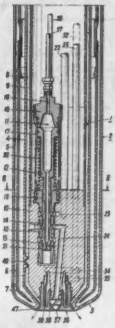
the solution to overflow through a screen that extends preferably vertically upwardly from the overflow rim of the vessel.

3,606,291
MOLTEN STEEL DEGASSING APPARATUS AND METHOD
Philip E. Schneider, Mount Lebanon, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 522,547, Jan. 24, 1966. This application May 15, 1969, Ser. No. 852,955
Int. Cl. C21c *7/10*
U.S. Cl. 266—34V **5 Claims**



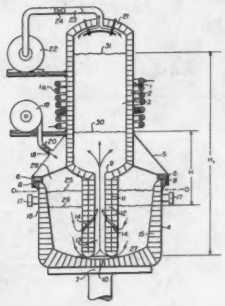
There is disclosed a method and apparatus for the degassing of molten metal, particularly steel, wherein there is a vertically elongated degassing chamber having its axis inclined away from the vertical. There is a hearth at the bottom of the degassing chamber that slopes from the high side toward the low side with an outlet port for discharging metal at the low side. There is a riser leg that opens through the hearth at the high side and extends downwardly from the hearth for a length ranging between two and two and one-half times the length of the barometic column of molten metal that may be drawn up into the leg above the level of molten metal in the ladle. When the apparatus is operating, provision is made for introducing gas into the riser leg at a level below the top of the barometric column. The metal is carried by expanding gases up the length of the tube above the top of the barometric column as droplets and expelled into the degassing chamber, falling back onto the sloping hearth clear of the riser leg. A receiving vessel is connected to the outlet port into which alloying ingredients may be introduced into the degassed metal.

3,606,292
BURNER-LANCE
Meinhard Truppe, Hellmuth Smejkal, Matthias Schernthaner, Günter Poferl, and Johann Hartl, Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria
Filed Apr. 9, 1970, Ser. No. 26,897
Claims priority, application Austria, Apr. 18, 1969, A 3,755/69
Int. Cl. C21c *7/00*
U.S. Cl. 266—34L **10 Claims**



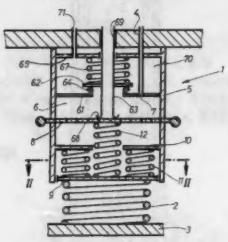
The invention proposes a burner-lance comprising in a cooling jacket a burner insertion including conduits for liquid fuel and a flush gas such as compressed air, a control block at the mouth end of the lance for selectively connecting said conduits to the nozzle outlet, and a steam pipe surrounding said conduits to keep the system warm, an annular canal for the suppply of the oxygen containing gas being formed between said burner insertion and said cooling jacket. This burner-lance is destined for heating or melting down a solid metal charge and when pure oxygen is used it is particularly well suited for refining. The burner-lance according to the invention meets high safety standards. Operation is readily started and terminated and choking of the nozzle parts is avoided.

3,606,293
METHOD AND APPARATUS FOR PURIFICATION OF MOLTEN METAL
Frank F. Erdely, Raleigh, N.C., assignor to Walter Sieckman, Allegheny County, Pa.
Original application Mar. 29, 1966, Ser. No. 538,296, now Patent No. 3,508,743, dated Apr. 28, 1970. Divided and this application Sept. 29, 1969, Ser. No. 871,143
Claims priority, application Switzerland, Apr. 2, 1965, 4,617/65
Int. Cl. C21c *7/00*
U.S. Cl. 266—34V **11 Claims**



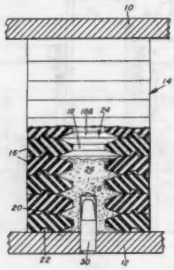
This disclosure relates to the purification of metals. It more particularly refers to the degasification of metals and especially to such metal degasification from metals which are molten.

3,606,294
BALANCING VALVE FOR A LOAD-RESPONSIVE BRAKE PRESSURE REGULATOR
Hans Pöllinger, Munich, Germany, assignor to Knorr-Bremse G.m.b.H., Munich, Germany
Filed July 25, 1969, Ser. No. 844,778
Claims priority, application Germany, July 26, 1968, P 17 80 045.2
Int. Cl. B60g *13/02*
U.S. Cl. 267—8 **10 Claims**



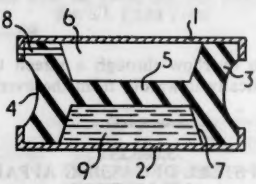
A load-responsive brake pressure regulator for railway vehicles has a balancing or weighing valve mounted between the frame and suspension on the undercarriage. The valve has a housing mounted on the frame and a pressure plate fastened upon the suspension moveable within the housing. The housing has a chamber connected to the air braking system closed by a diaphragm with valve means regulating the pressure within the chamber in response to the weight of the vehicle. A number of spring elements are uniformly distributed between the pressure plate and annular surface within the housing and at least one spring element is between the pressure plate and the diaphragm. An annular member of a resilient synthetic plastic material may be used between the pressure plate and annular surface and a cylindrical member of like material between the pressure plate and diaphragm.

3,606,295
SHOCK ABSORBER
Bernard Simon Appleton, Woodmere, N.Y., assignor to Unilan A.G., Chur, Switzerland
Filed Oct. 17, 1969, Ser. No. 867,216
Claims priority, application Italy, Nov. 12, 1968, 53,852A/68
Int. Cl. B60g *11/22;* B61g *11/00;* F16f *1/36*
U.S. Cl. 267—63 **12 Claims**



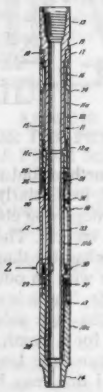
A spring or shock absorber adapted for vehicle suspension systems and the like comprising a stack of elastomeric discs lying one on the other and an axially extending bore through the stack filled with a flexible plastic foam which joins the discs together into a unitary structure.

3,606,296
APPARATUS FOR ABSORBING SHOCKS AND VIBRATIONS
Pierre Chassagne, Chamalieres, France (% Fort Dunlop, Erdington, Birmingham 24, England)
Filed Feb. 24, 1969, Ser. No. 801,493
Claims priority, application France, Mar. 5, 1968, 22,186
Int. Cl. F16f *9/10*
U.S. Cl. 267—113 **7 Claims**



An anti-vibration mounting comprising a rubber sleeve sealed at each end and divided internally into one compartment vented to the atmosphere and a second compartment filled with a liquid, the sleeve being shaped so that the side walls buckle radially inwardly when compressed axially.

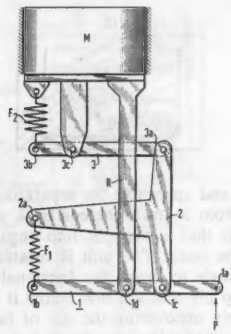
3,606,297
ENERGY ACCUMULATOR AND SHOCK ABSORBING DEVICE FOR WELL PIPE STRINGS
Derrel D. Webb, Houston, Tex., assignor to Houston Engineers, Inc., Houston, Tex.
Filed Dec. 18, 1969, Ser. No. 886,221
Int. Cl. E21b *17/00;* E21c *5/00,* E16f *9/02*
U.S. Cl. 267—125 **2 Claims**



A well tool comprising telescopically arranged tubular members connectable in a well string for relative longitudinal movement between extended and contracted positions. A piston on the inner tubular member is sealably slidable within a closed chamber formed in the annular space between the tubular members. The piston has a check valve which permits flow past the piston upon movement in the chamber in one direction. A means is

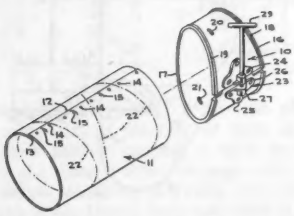
also provided for relieving excessive pressure in the chamber upon movement of the piston in the opposite direction within the chamber.

3,606,298
METHOD AND APPARATUS FOR SUPPRESSING THE TRANSFER OF MECHANICAL OSCILLATIONS
Fritz Schaumann, 28 Ringstrasse, (D 52) Siegburg, Germany
Filed Jan. 13, 1969, Ser. No. 790,639
Claims priority, application Germany, Jan. 18, 1968, P 16 75 019.9
Int. Cl. F16f *15/00*
U.S. Cl. 267—137 **13 Claims**



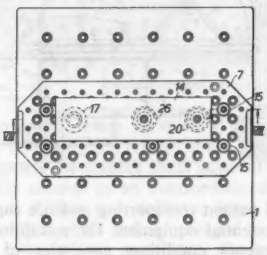
The transmittal of mechanical oscillations or impulses is suppressed according to the invention by the cooperation of spring members having different spring rates, with translational gear or drive means having translation or reduction ratios which are variable in response to the amplitude and/or slope of the characteristic of said oscillations or impulses whereby an excursion of a point of a first drive means is transferred to a second drive means at a predetermined, preferably at a reducing ratio, said spring member for the first drive means being softer than the spring member of the second drive means.

3,606,299
JIG DEVICE
Raymond F. Twickler, Sr., 65 Sedgefield Drive, Harahan, La. 70123
Filed Feb. 26, 1969, Ser. No. 802,593
Int. Cl. B25b *5/00*
U.S. Cl. 269—2 **1 Claim**



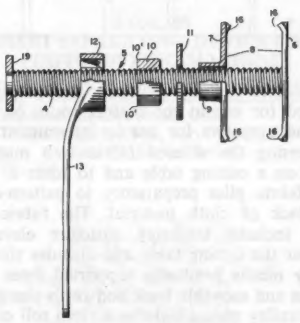
A jig suitable for use with a workpiece having alignment means including means mountable on the workpiece, and the mountable means having means for guiding working means along the workpiece, means cooperable with the alignment means of the workpiece to position the guide means relative to the workpiece and means for detachably securing the mountable means on the workpiece.

3,606,300
DEVICES FOR SUPPORTING WORKPIECES
Peter Grant Davis, London, England, assignor to Molins Machine Company Limited, London, England
Filed Jan. 13, 1969, Ser. No. 790,780
Claims priority, application Great Britain, Jan. 15, 1968, 2,139/68
Int. Cl. B23g *3/00*
U.S. Cl. 269—296 **6 Claims**



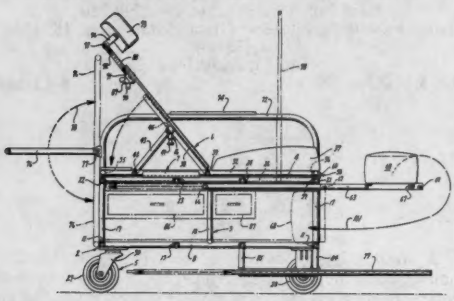
For fixing a workpiece to a pallet having tapped fixing holes at the junctions of a square grid, an intermediate plate member is provided having holes by which it may be secured to the pallet at different positions by means of screws passing into the tapped holes in the pallet. The plate member also has fixing holes at the junctions of a square grid, but of closer spacing for securing supports for the workpiece. A support device is disclosed comprising a housing having a screwed part to screw into a fixing hole in the plate member. The housing contains a spring loaded screw to be screwed into a tapped hole in the workpiece.

3,606,301
CLAMPING DEVICE
Frank D. Ultimo, 406 9th St., Brooklyn, N.Y. 11215
Filed June 25, 1969, Ser. No. 836,443
Int. Cl. B25b *5/10*
U.S. Cl. 269—243 **5 Claims**



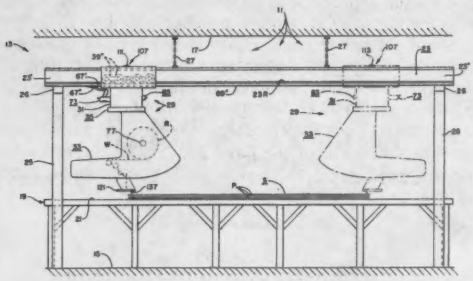
A simple and rugged clamping device useful for various purposes in many trades but particularly adaptable in carpentry for holding together two angularly disposed timbers while they are being nailed, one to the other.

3,606,302
LIFE SUPPORT CART
Charles D. Allard, 1620 Hickory Ave., San Leandro, Calif. 94579; Eugene R. Allard, 1809 A Pearl St., Alameda, Calif. 94501; and Robert Ross Newlon, 2060 E. St., Hayward, Calif. 94577
Filed June 2, 1969, Ser. No. 829,643
Int. Cl. A61g *13/00*
U.S. Cl. 269—325 7 Claims



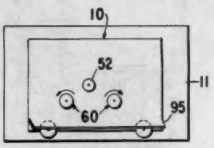
A wheeled patient transporting and life supporting cart having the essential equipment for sustaining life under certain emergency conditions consisting of a frame, a detachable multi-position patient supporting member, extendible leg rest for the supine position and an extendible foot rest for the sitting position.

3,606,303
CLOTH SPREADING APPARATUS
Kelly J. Johnson, 3513 General Hood Trail, Nashville, Tenn. 37204
Filed Oct. 30, 1969, Ser. No. 872,618
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 8 Claims



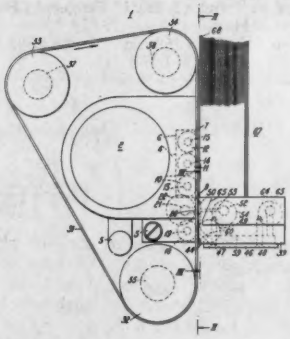
Rolled fabric cloth spreading or cloth laying apparatus adapted for use in the cutting room of a garment factory and operative for use in intermittently severing and dispensing the severed fabric web material of a cloth roll on a cutting table and to form a multi-layer stack of fabric plies preparatory to pattern-cutting the layered stack of cloth material. The fabric spreading apparatus includes trackway structure elevatingly arranged over the cutting table and includes cloth dispensing trolley means pendantly supported from the trackway means and movable back and forth along the trackway. The trolley means includes a cloth roll carrying and cloth dispensing lower section pendantly turnably supported from the trolley upper section. The cloth roll carrying lower section is pivotally turnably 180° on a vertical pivot axis and is operative for turning the front of the trolley lower section leftward or rightward at longitudinally spaced apart portions of the overhead trackway structure. The trolley means is adapted for dispensing cloth as it travels in one or the other direction along the trackway structure. The spreading apparatus is particularly adapted for face-one-way type cloth spreading procedure and for use in depositing a multi-layer stack of cloth on a cutting table with a particular side surface of each cloth layer being in corresponding arrangement.

3,606,304
MATERIAL SEPARATION DEVICES AND METHODS
Peter Hrinko, Jr., Fairlawn, N.J., assignor to The Singer Company, New York, N.Y.
Filed May 2, 1969, Ser. No. 821,190
Int. Cl. B65h *3/02*
U.S. Cl. 271—21 5 Claims



A method and apparatus for separating fabric material in seriatim from a stack thereof by a pneumatic rotary actuation unit that is brought into engagement with the top ply of the stack. The unit is rotated through a predetermined angle to break the frictional engagement between the top ply and the one below it and to twist and lift the top ply uncovering the ply of fabric below it. A clamp is pneumatically brought to bear on the stack on all but the top ply to hold the stack firmly. The rotary unit is removed from engagement with the stack and a transfer device carries the separated ply to another station while the clamp remains in place.

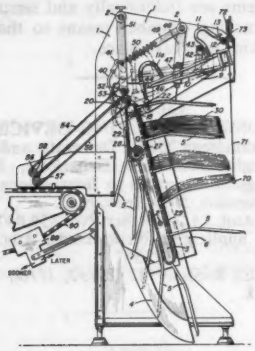
3,606,305
DOCUMENT FEEDING DEVICE
Raymond Gilbert Remigius-Dominicus Debackere, Edegem, and Willy Alfons Franciscus Mens, Wommelgem, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 850,406
Claims priority, application Netherlands, Aug. 23, 1968, 6812027
Int. Cl. B65h *3/12*
U.S. Cl. 271—26 11 Claims



Apparatus for sorting documents by means of vacuum chamber application through a perforated conveyor belt. The apparatus is characterized by providing means for preventing two or more documents from being simultaneously separated from the stack contained in a magazine.

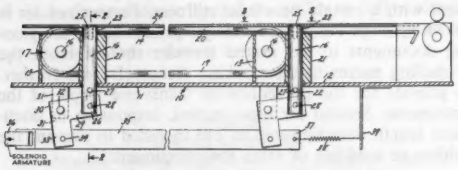
Pressurized air is directed against the leading transverse edge of the documents in an oblique direction relative to the document plane. A vacuum is created substantially opposite the vacuum chamber for applying to the opposite side of the documents suction directed perpendicular to the plane thereof. The documents are subjected also to a second air pressure in the same direction as the above-mentioned perpendicular vacuum.

3,606,306
PAPER BAG FEEDER
Charles K. Brown, Jr., and David K. Brown, Richmond, Va., assignors to Brown-Fielder, Inc., Richmond, Va.
Filed Jan. 22, 1969, Ser. No. 793,133
Int. Cl. B65h *1/18*
U.S. Cl. 271—31 **8 Claims**



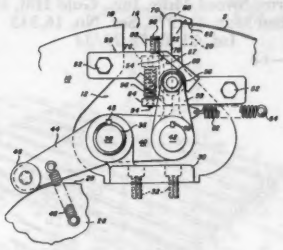
An accumulating conveyer and single feeder for folded sheets, especially of multiple ply such as bag tubes, is provided. A stack of bag tubes is presented vertically upward upon horizontal loading arms. Single bag tubes are removed from the top of the presented stack by transfer arms having vacuum cups. Hold-back elements consolidate each bag tube by a draping bend. This locks the plys together preventing fan-out for trouble-free transfer into a double belt conveyer for a subsequent operation.

3,606,307
MOVING TABLE SHEET TRANSPORT FOR COPYING MACHINES
David L. Herman, 63 Catherine Road, Scarsdale, N.Y. 10583
Filed Mar. 11, 1969, Ser. No. 806,269
Int. Cl. B65h *5/02*
U.S. Cl. 271—46 **1 Claim**



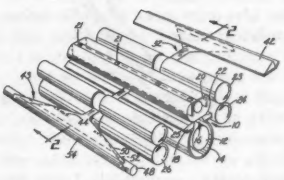
Sheet transportation means for use with photocopying machines comprising a plurality of belts moving in a relatively fixed path of motion, a table having slotted openings in the plane thereof through which said belts may pass, means for raising said table with respect to said belts whereby paper resting upon said table is moved free of contact with said belts, and for lowering said table below the level of the uppermost continuous segment of the belts, whereby the under surface of the sheet is engaged by the belts to be transported in a plane parallel to that of the table.

3,606,308
SHEET GRIPPING DEVICE
Harry E. Mowry, Louis A. Ricardo, and Guy V. Carricato, Pittsburgh, Pa., assignors to Miller Printing Machinery Co., Pittsburgh, Pa.
Filed June 20, 1969, Ser. No. 835,062
Int. Cl. B65h *5/14*
U.S. Cl. 271—53 **14 Claims**



A sheet gripping device includes a gripper assembly nonrotatably mounted on a gripper shaft. An link member rotatably supports the gripper shaft adjacent one end and is nonrotatably secured to an intermediate shaft adjacent the other end. A first cam follower lever is connected to the intermediate shaft and is arranged to oscillate the end of the link member supporting the gripper shaft. A second cam follower lever is nonrotatably connected to the gripper shaft and has a cam roller urged into abutting relation with a cam surface fixed on the cylinder. Movement of the link member by the first cam follower moves the gripper along a path similar to the cam surface against which the cam roller on the second cam follower is urged. The configuration of the cam members determines the path followed by the gripper assembly. The gripper assembly includes a lever nonrotatably secured at one end to the gripper shaft with a bracket extending laterally therefrom. The gripper member has a laterally extending gripper finger that abuts a gripper pad on the cylinder with an end portion extending laterally therefrom. The gripper member also has an intermediate portion with an adjusting screw movable longitudinally relative to the gripper member. The gripper member is slidably positioned on the lever and a spring between the bracket and gripper member end portion urges the gripper finger against the gripper pad. Upon upward movement of the lever, the bracket thereon contacts the adjusting screw on the gripper member and lifts the gripper finger from the gripper pad.

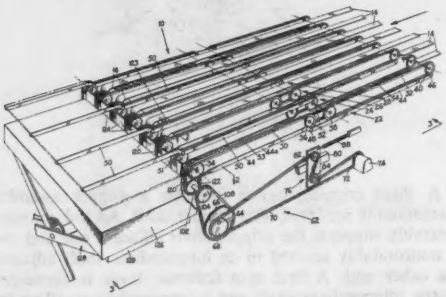
3,606,309
SHEET SEPARATING DEVICE FOR PHOTOCOPYING MACHINE
Edward J. Petrick, Euclid, and Raymond J. Schmidlin, Lyndhurst, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed May 1, 1970, Ser. No. 33,674
Int. Cl. B65h *29/64*
U.S. Cl. 271—64 **9 Claims**



A sheet separating device for an electrostatic contact type copying machine. The separating device is formed

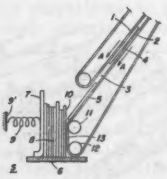
of a thin web of transparent material which has on the exit side a sheet diverter formed of a pair of diverging sections each of which sections flare outwardly.

3,606,310
STACKING APPARATUS
Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.
Filed Mar. 4, 1970, Ser. No. 16,333
Int. Cl. B65h *29/34*
U.S. Cl. 271—68 **7 Claims**



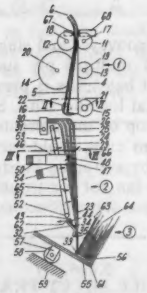
Stacking apparatus including a pair of parallel, laterally spaced, elongated conveyor belts for supporting the undersides of articles and conveying them forwardly along a horizontal path. A pair of endless, elongated chains are mounted in tandem between the conveyor belts with their upper reaches paralleling and beneath the path of the conveyor belts. An elongated stacker arm paralleling the conveyor belts is connected to the chains. The arm is connected to the chains in such a manner that powered movement of the chains with their upper reaches moving forwardly causes the arm to move successively first upwardly, to a raised position above the path of the conveyor belts to lift an article from the conveyor belts, then forwardly to a raised extended position, thence downwardly and below such path, and thence rearwardly, to a lowered retracted position. Another stacker arm connected to a matching pair of chains is moved out-of-phase with the first-mentioned arm. A stop member mounted forwardly of the conveyor belts engages an article carried by either arm as the arm is retracted, and operates to move the article off the arm. Motor-powered means moves both stacker arms at variable speeds. An elevator with platform receives articles moved off the arms.

3,606,311
STACKING APPARATUS FOR CARD LIKE ITEMS
Shoichiro Yoshimura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Apr. 30, 1969, Ser. No. 820,456
Claims priority, application Japan, May 1, 1968, 43/28,790
Int. Cl. B65h *29/68*
U.S. Cl. 271—68 **6 Claims**



Stacking apparatus for card like items is provided in accordance with this invention for use in conjunction with card handling systems. According to an exemplary embodiment of the present invention, stacking apparatus including conveyor means and stacking chamber means is provided wherein such conveyor means is positioned intermediate a path of incoming card like items and said stacking chamber means. The conveyor means is adapted to be driven at a speed which is less than the velocity of the incoming card like items presented thereto, and in addition, said conveyor means is provided with projecting fin means fixedly mounted thereto so as to form discrete pockets thereon. As thus provided, said conveyor means acts upon an incoming stream of card like items to divide such incoming card like items into small subgroups which are each inserted and conveyed toward said stacking chamber means in one of the discrete pockets formed on said conveyor means. Thus, in spite of an overlapping relationship between some of the card like items present in the incoming stream of card like items, small subgroups of said card like items are individually and separately conveyed to said stacking chamber means so that accurate and orderly stacking may take place.

3,606,312
DOCUMENT STACKING DEVICE
Willy Alfons Franciscus Mens, Dasstratt, and Raymond Gilbert Remigius-Dominicus Debackere, Perd, Verbiestlaan, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Aug. 14, 1969, Ser. No. 850,047
Claims priority, application Netherlands, Aug. 30, 1968, 6812347
Int. Cl. B65h *29/22, 29/52, 31/06*
U.S. Cl. 271—71 **15 Claims**

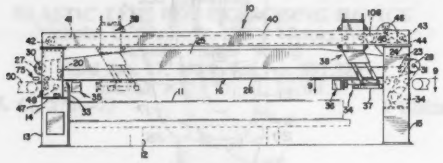


Apparatus for stacking at high speeds documents ranging in weight from the very light to the relatively heavy, comprising document propelling means, guiding and air blowing means, and a stacking receptacle. The invention includes a curved guide frame which provides the document with a certain beneficial stiffness. Pressurized air is blown through the guide frame perpendicular to the passing documents to aid in the transfer thereof from the propelling means to the stacking receptacle, and further, to provide for the prevention of transverse ripple of the documents. Second air blow means, responsive to document length detecting means, are included to prevent the folding or buckling of extra long documents.

3,606,313
SHEET PILER HAVING MOVABLE SIDE GUIDES
Dario Buccicone, Gary, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.
Filed July 30, 1969, Ser. No. 845,949
Int. Cl. B65h *31/20, 31/36*
U.S. Cl. 271—86 **9 Claims**

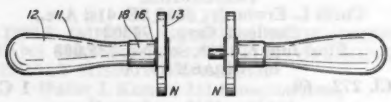
A machine for piling metal sheets which employs an overhead conveyor for advancing sheets for deposit on a lift, or the like, at a piling area, end stop and back stop

mechanisms, and side edge guide mechanisms for cooperation with the end stop and back stop mechanisms, which side guide mechanisms are arranged in pairs, adjustable laterally of the path of travel of the sheets. One pair of the side guide mechanisms is in a fixed position at the entrance end of the machine and another pair thereof is carried on a longitudinally adjustable end stop carriage. The side guide members, which are reciprocated as the sheets are dropped to facilitate the piling of sheets delivered off center, are carried on support arms which may



pivot upward so as to avoid damage upon accidental raising of the lift sufficient to strike the guides. A drive motor for adjusting all the side guides simultaneously, drives an adjusting screw for the pair of side guides at the entrance end of the machine and is connected by a chain drive with a screw for adjusting the pair of side guides on the end stop carriage, with a clutch arrangement for preventing operation while the end stop carriage is being repositioned.

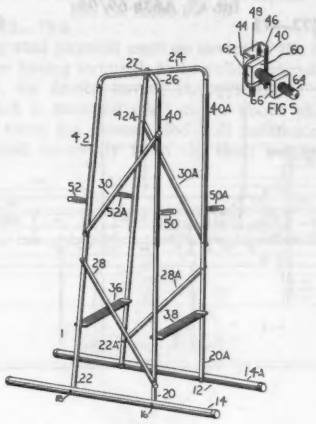
3,606,314
MAGNETIC TEACHING GAME
Charles G. Popp, 1712 S. Clifton, Park Ridge, Ill. 60068
Filed July 16, 1969, Ser. No. 842,209
Int. Cl. A63b *21/00*
U.S. Cl. 272—57R **3 Claims**



Magnetic game apparatus to be played-used by the physically and mentally handicapped. Comprises, with various refinements, a pair of circular, repelling magnets which are adapted to mate with each other. The student develops manual dexterity and the ability to follow simple instructions by attempting to mate the two magnets in opposition to the repelling forces.

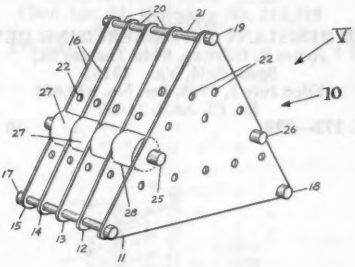
3,606,315
HAND CLIMBER
Martin Green, Mahwah, N.J., assignor to No Limit Inventions, Inc., Mahwah, N.J.
Filed Mar. 18, 1969, Ser. No. 808,270
Int. Cl. A63b *17/00*
U.S. Cl. 272—60 **2 Claims**

A hand climber where children can compete in climbing. A cage is mounted on a base with outer rails. The rails have inwardly flanged walls. Instead of pegs, elongated peg-like handles are used which have a sliding element at one end disposed in the rail for vertical movement therealong in parallel spaced relationship so that a person can grasp one with each hand. Children and learners can exercise safely with the device since the handles will not come out of the tracks and when gripped will not slide down. Also, the handles, unlike pegs do not have to be inserted into holes so that there is no missing and slipping. The device provides a means for children to



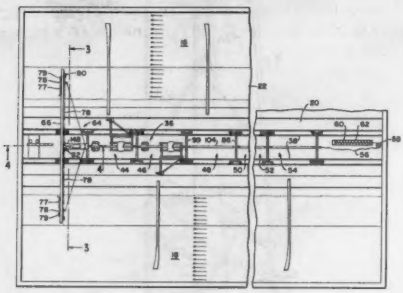
start obtaining the skill which they will require in the future, and if necessary prepares athletes for using pegs with holes.

3,606,316
FINGER AND HAND MUSCLE EXERCISE DEVICE
Semyon E. Krewer, 514 W. 110th St., New York, N.Y. 10025
Filed May 28, 1969, Ser. No. 828,515
Int. Cl. A63b *11/08*
U.S. Cl. 272—67 **19 Claims**



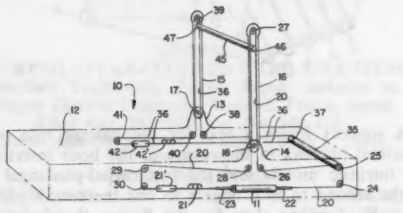
A support forms a rest for the palmar side of the proximal phalanx in the region of the bone insertion of the intrinsic muscle and the metacarpal-phalangal joint of the second to fifth fingers to rest thereon; a plurality of walls, forming slots for the fingers therebetween in the order of a width of a finger, extend in a direction generally perpendicularly away from said support adapted to confine and separate the fingers therebetween, so that the fingers can fan out from the support. The walls are sufficiently rigid to act as a resistance for isometric exercise of finger abduction and adduction thereagainst with transverse holes therethrough for the insertion of stop pins against which the fingers may be exercised, and around which rubber bands may be looped for additional exercising of finger and hand muscles. The support may be a molded plastic structure, integral with the walls, or it may be a cushioned support rod for the proximal phalanx, extending between the walls.

3,606,317
ROWING SIMULATOR
Jack H. Frailey, 9 Martha's Point Road, Concord, Mass. 01742
Filed Oct. 13, 1969, Ser. No. 865,687
Int. Cl. A63b *69/06*
U.S. Cl. 272—72 19 Claims



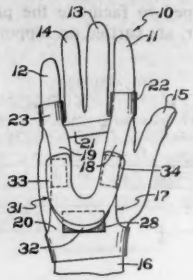
A simulator for rowing includes a rail-supported train of rolling dollies each having a suspended cradle mounting a sliding seat, a footboard and a rigger. The rails stand on a pier between a pair of flumes for pumped circulating water in which the oars are swept. The drag of water friction on the hull of a shell is simulated by the force of the flowing water on vanes supported on a yoke that is carried by the train. The vane positions are adjustable to compensate for rolling friction and are automatically responsive to control the mean longitudinal position of the train in relation to the pier. Alternatively or additionally, a servo control automatically varies the pump speed and thereby the water speed to control the train's position.

3,606,318
FLUID RESISTANT TYPE EXERCISING DEVICE
James B. Gilstrap, 8440 Thames St., Springfield, Va. 22151
Filed July 3, 1969, Ser. No. 839,001
Int. Cl. A63b *21/00*
U.S. Cl. 272—79R 10 Claims



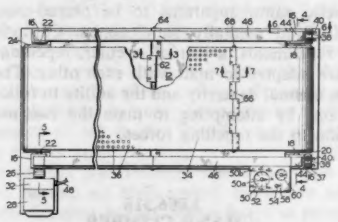
A fluid control apparatus comprising a pair of fluid chambers in fluid communication with each other and including pistons for moving the liquid from one chamber to the other through restricted valve openings, the size of the valve opening being dependent upon the magnitude of an external force applied to the pistons. An adjusting device sets the amount of the fluid force required to open the valve. The pistons are connected to a manually movable cross bar. The rate of movement of this cross-bar is dependent upon the force exerted by the exerciser on the bar.

3,606,319
BOWLING AID
Fred L. Borden, Akron, Ohio, assignor to Gold Palm Enterprises, Inc., Akron, Ohio
Filed Dec. 29, 1969, Ser. No. 888,411
Int. Cl. A63b *71/14*
U.S. Cl. 273—54B 11 Claims



A bowling aid comprising a U-shaped panel member having a pair of leg portions with a connecting member holding the outer end portions of the leg portions in position with a pair of finger loops at the respective ends of the leg portions thereof for receiving the index finger and little finger and having a wristband portion integrally formed with the base of the panel member for encirclement about the wrist to support the wrist and firmly secure such panel member to the hand. A contoured rigid U-shaped member is adjustably attached to the panel member for positioning and cradling a bowling ball prior to delivery of the bowling ball.

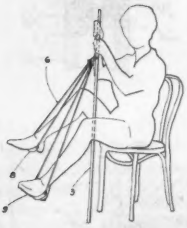
3,606,320
TREADMILL
Curtis L. Erwin, Jr., 5010 SE. 41st Ave., Portland, Oreg. 97202
Filed June 6, 1968, Ser. No. 735,008
Int. Cl. A63f *23/06*
U.S. Cl. 272—69 1 Claim



A frame has a pair of end drums over which operates an endless belt. One of the drums is driven by a variable speed electric motor to cause traveling movement of the belt whereby a person can exercise by running on the belt. An odometer is connected into the drive system to measure the distance traveled by the belt. The odometer has a distance indicating dial, preferably miles and fractions thereof, and operates a switch in the circuit to the drive motor to control operation of the motor. Also provided are variable speed control means for the motor and also a time indicator, the speed control means operating a

switch in the circuit to the drive motor and arranged to control off and on operation of the motor. A hand rail is provided on the frame, and a housing is mounted on the handrail for supporting the odometer, speed control means and time indicator in a conveniently accessible and viewable position. The belt has a roughened surface for conditioning the feet. The frame and belt have a disconnectable joint allowing them to be folded into a compact package for shipment and storage.

3,606,321
ELASTIC TYPE LEG EXERCISING DEVICE
Nicholas D. Macoulis, 19231 Victory Blvd., Reseda, Calif. 91335
Filed Jan. 27, 1969, Ser. No. 801,220
Int. Cl. A63b *23/02, 23/04*
U.S. Cl. 272—73 **1 Claim**



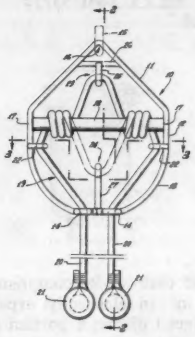
An exercising pole having a pair of elongate elastic members attached thereto. The elastic members have attached stirrups into which the user may insert his feet while in a seated position. One end of the pole is placed on the floor and the user may simulate a cycling action for controlled exercise.

3,606,322
MULTIPLE IMPACT MEMBERS WITH GRIPPING MEANS INTERDISPOSED FOR STRIKING A FLEXIBLY SUSPENDED OBJECT
Walter J. Kersch, 331 Hampton Ave., Rensselaer, N.Y. 12144
Filed Oct. 29, 1968, Ser. No. 771,432
Int. Cl. A63b *59/00, 67/10*
U.S. Cl. 272—76 **2 Claims**

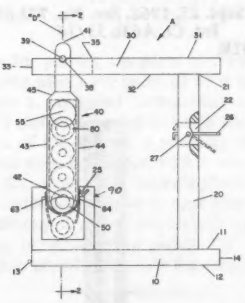
This invention relates to a practice and training game wherein a flexibly suspended object is struck in rhythmic succession by impact members formed integrally and alternately with gripping means. The training game serves to develop manual dexterity in combination with visual, mental and muscular coordination.

3,606,323
LINE PULLING FRICTION TYPE EXERCISE DEVICE
Peter Ottaviani, 7260 Hillside, Suite 306, Hollywood, Calif. 90028
Filed June 11, 1968, Ser. No. 736,145
Int. Cl. A63b *21/00*
U.S. Cl. 272—79A **8 Claims**

An integrated physical exercise device of the type utilizing a rope having terminals to be pulled against variable resistances, the device having an open frame structure within which is mounted shaft means about which multiple rope turns are wound, and pull resistance control means spaced outwardly from the shaft means to support an intermediate extent of the wound rope in a manner permitting variation of the number of rope turns and therefore the rope pull resistance.



3,606,324
PENDULUM LANCEMANSHIP GAME
Dale K. Welbourn and Norma J. Welbourn, both of Neola, Iowa 51559
Filed Apr. 23, 1969, Ser. No. 818,519
Int. Cl. A63f *9/00*
U.S. Cl. 273—1R **4 Claims**



A pendulum lancemanship game including an internal elongated slot for the pendulum extending linearly upwardly from the pendulum lower free end and adapted to receive a plurality of annular target members releasable downwardly consecutively from the pendulum lower free end through convergent resiliently-deflectable straps which also support the several targets. The pendulum is suspended from an upright support. A hook is provided on the pendulum and a releasable catch is provided on the pendulum support to engage the hook and hold the

pendulum free end in an offset position. A removable apertured shield is also provided to make the lancing task more difficult.

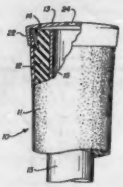
ERRATUM

For Class 273—54 see:
Patent No. 3,606,319

3,606,325
GOLF CLUB GRIP

Robert E. Lamkin, Downers Grove, and Joseph P. Lamkin, Chicago, Ill., assignors to Lamkin Leather Company, Chicago, Ill.

Filed Apr. 27, 1970, Ser. No. 32,103
Int. Cl. A63b *53/14*
U.S. Cl. 273—81.5 6 Claims

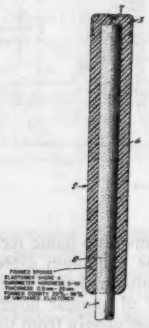


A grip for golf club shafts comprising an elongated open-ended tube of an elastically expandable material and having a reduced diameter portion at its upper end which tapers upwardly and outwardly. About this upper portion is a metal clamp ring, correspondingly tapered, and having at its upper edge an outwardly extending flange. A gripping surface material is affixed about the elastic tube and clamp ring. An end cap is disposed atop the tube and is crimped to frictionally lock the upper end of the gripping surface material between its inside walls and the outer wall of the clamp ring.

3,606,326
GRIP FOR HAND POWERED IMPLEMENTS

William J. Sparks, Westfield, N.J. (5129 Granada Blvd., Coral Gables, Fla. 33146), and Charles E. Sparks, Westfield, N.J. (102 Evans Lane, Cherry Hill, N.J. 08034)

Filed Sept. 25, 1968, Ser. No. 773,689
Int. Cl. A63b *53/14*
U.S. Cl. 273—81R 9 Claims

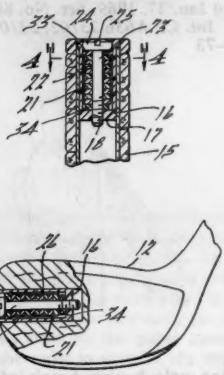


The shaft portion of a hand operated and hand powered tool or club is covered by a superimposed layer of a foamed sponge elastomer to form an improved grip. The grip is especially useful for golf clubs. On swinging the club the grip improves precision, prevents slippage, and reduces shock at the time of impact. The elastomer has a Shore A durometer hardness ranging from about 5 to 40, and a thickness from about .5 mm. to 25 mm. In one embodiment, the elastomer is a foamed filled neoprene.

3,606,327
GOLF CLUB WEIGHT CONTROL CAPSULE

Joseph M. Gorman, 15418 Mansfield, Detroit, Mich. 18227

Continuation-in-part of application Ser. No. 470,007, July 7, 1965. This application Jan. 28, 1969, Ser. No. 794,701
Int. Cl. A63b *53/08, 53/14*
U.S. Cl. 273—81A 1 Claim

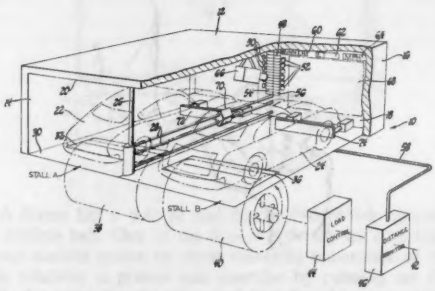


A golf club has a like number of dissimilar washers in an aperture in the golf head and in the golf club shaft so arranged that the washers are interchangeable. This permits the weight of the golf head to be altered without changing the overall weight of the golf club. The washers are slidably mounted on a screw with an elastomeric washer against the head and on the end to retain the washers in the screw when moved and for sealing the head end when disposed in a cavity.

3,606,328
VEHICLE DRAG RACING SIMULATOR ASSEMBLY

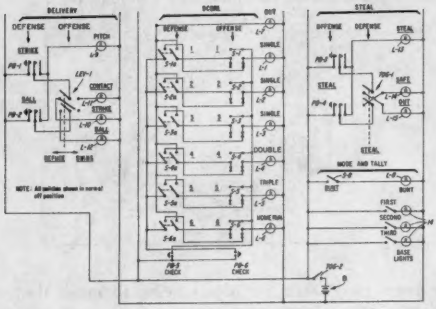
John B. Delphia, Jr., 2052 Portlock, Union Lake, Mich. 48085

Filed Jan. 2, 1970, Ser. No. 143
Int. Cl. A63g *33/00*; F16h *37/00*; G07f *1/00*
U.S. Cl. 273—86R 18 Claims



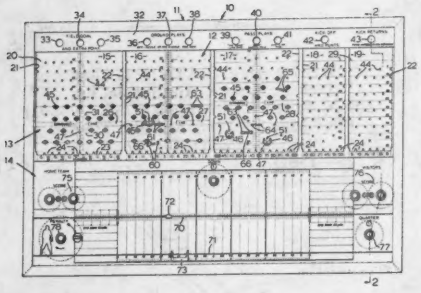
A drag race simulator assembly including a building enclosing two racing stalls, dynamometer type traction rolls in each stall and signal lights including stagging lights and progress lights and other indicators for simulating racing conditions. The assembly is coin operated.

3,606,329
ELECTRIC BASEBALL GAME
Harold U. Wilson, 1630 Dartford Road, Baltimore, Md. 21221
Filed Apr. 8, 1969, Ser. No. 814,315
Int. Cl. A63f 7/06
U.S. Cl. 273—88 **8 Claims**



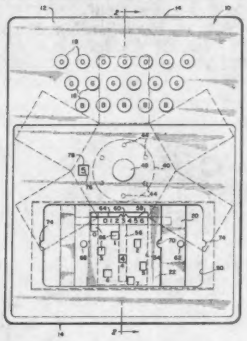
An electric type baseball board game which can be utilized for amusement purposes. The game includes a playing field representation, together with lights for indicating plays on the board. Offense and defense panels are provided, each including switches for initiating plays of the game. Chance circuitry is provided interconnecting the switches of the offense and defense panels, and the indicator lights. Operation of selected ones of the offense and defense switches causes selected ones of the indicator lights to light, in accordance with the chance circuitry, to indicate the result of a given play. A shunt circuit is provided to review and indicate which of the offense switches have been selected on any given play.

3,606,330
TOY FOOTBALL GAME
Frederick George Chapman, 1538 Boxwood Way, Port Credit, Ontario, Canada
Filed Oct. 29, 1969, Ser. No. 872,187
Claims priority, application Canada, Sept. 29, 1969, 62,726
Int. Cl. A63f 7/06, 7/14
U.S. Cl. 273—94R **10 Claims**



A toy football game in which the individual plays are determined by the movement of a playing ball over a selected one of a number of inclined playing surfaces each with upstanding pins and game pieces. Each of the playing surfaces represents an individual kind of football play. The positioning of the pins is predetermined on each surface as is the position of most of the game pieces, but certain of the game pieces are movable into a limited number of chosen positions. These latter game pieces are shaped to receive the playing ball, and, in the chosen positions may be rotated by interaction with the ball. The result of the play is determined by the final resting position of the playing ball either, in the case of the ball coming to rest against a game piece or pin, from markings on the play area floor relative to a scrimmage line, or, when the ball rests in one of a series of terminal stall, from the markings indicated on the individual stall. Penalties are incurred by the movement of the playing ball over the predetermined paths and determined by random selection. Provision is also made for indicating the state of the game by a representation of a football field, a movable miniature football, and movable yardage markers.

3,606,331
COMPUTER-CONTROLLED APPARATUS FOR PLAYING GAME OF NIM
David Morris, Brooklyn, N.Y., assignor to Educomp Science Corporation, Dover, Del.
Filed Feb. 13, 1969, Ser. No. 798,907
Int. Cl. A63f 3/00
U.S. Cl. 273—130R **13 Claims**

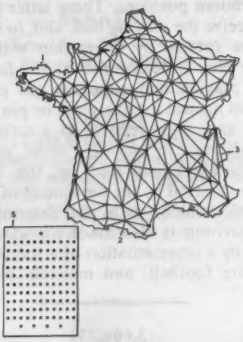


Apparatus for playing the game of NIM in which three rows of playing pieces are received by a base panel which also supports a computer comprising a rotatable disc and a pair of sliders mounted beneath the base panel The upper surface of the disc has a plurality of sets of indicia, each of which may be aligned with a window in the base panel, and the sliders are superimposed upon the disc beneath the window and have apertures which may be aligned to display a move determined by the computer. Color coding of the playing pieces, the disc, the sliders, and the indicia greatly facilitate the playing of the game.

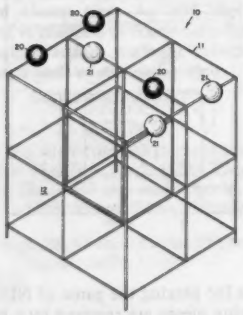
3,606,332
BOARD GAME APPARATUS
Salomé Gerstler, Avenue Minerve No. 21, Brussels 19, Belgium
Filed Dec. 16, 1968, Ser. No. 783,837
Claims priority, application Belgium, Jan. 10, 1968, 53,142
Int. Cl. A63f 3/02
U.S. Cl. 273—131BB **3 Claims**

Means for playing a board game comprise a plurality of duplicate copies of a map, one for each player, each said map comprising a plurality of perforations each

representing a town in a country, and a plurality of counting units for insertion in said perforations, markings on the map indicating distances between perforations. Further the game playing means include a device for adding distances in the form of a board having columns of numbers.



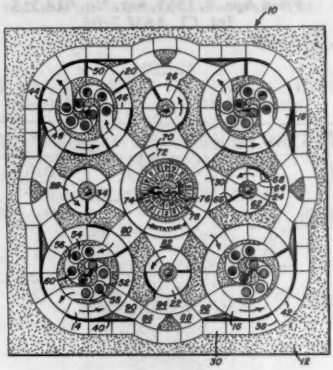
3,606,333
THREE-DIMENSIONAL BOARD GAME APPARATUS
Lawrence E. Green, 271 Columbus Ave., San Francisco, Calif. 94133
Filed Nov. 14, 1969, Ser. No. 876,634
Int. Cl. A63f *3/02*
U.S. Cl. 273—131A **4 Claims**



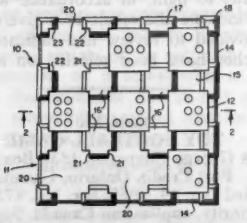
A three-dimensional game comprising a hexahedral framework of rods arranged to form a compact array of eight hexahedral elements substantially equal in size, and a plurality of game pieces each formed with a partially bisecting slot arranged to intersect and removably engage rods of the framework. In one example the framework rods are formed of magnetically permeable material, and an elongate magnet is seated along the base of the bisecting slot of each game piece for magnetically engaging the rods of the framework.

3,606,334
GAMEBOARD WITH ROTATABLE DISCS
Gary L. Pippin, 1859 S. 31st, Kansas City, Kans. 66106
Filed Feb. 3, 1970, Ser. No. 8,367
Int. Cl. A63f *3/02*
U.S. Cl. 273—134E **5 Claims**

A rigid gameboard having a substantially planar playing surface with a plurality of paths of movement for game pieces delineated thereon with a plurality of rotatable discs associated with the paths of movement to control the movement of the game pieces along with a chance device indicating the number of movements to be made by a game piece with the object being to move the game pieces from a start position to a final position on the gameboard.

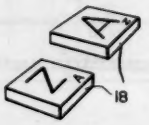


3,606,335
BOARD GAME APPARATUS
Lawrence L. Reiner, Woodbury, Donald Rouse, New York, and John O'Shaughnessy and John Rich, Staten Island, N.Y., assignors to Reiner and Rouse, New York, N.Y.
Filed Feb. 12, 1970, Ser. No. 10,886
Int. Cl. A63f *3/00*
U.S. Cl. 273—135R **6 Claims**



Game apparatus including a board with a field of play having rows of upwardly opening recesses, and light permeable playing pieces each having a characteristic pattern of markings, the playing pieces being superposable in the recesses to visually present a predetermined array of markings.

3,606,336
WORD ASSOCIATION GAME
Jack R. Krause, Alexandria, La. (802 N. Puget St., Olympia, Wash. 98501)
Filed May 29, 1968, Ser. No. 733,119
Int. Cl. A63f *3/00*
U.S. Cl. 273—135D **1 Claim**



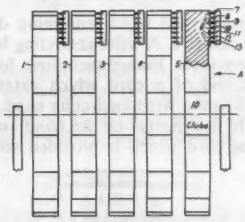
A word association game which includes an indicator board having a series of alphabet letters and a series of numerals peripherally spaced thereon, with a rotatable pointer associated therewith to be spun to indicate a number and a letter, to aid in starting the game, and to be

spun to indicate a numeral to aid in continuing the game. Lettered playing pieces, each having a first letter on two opposed faces, and an index letter on each of the two opposed faces differing only in size from the letter on the opposite face, are provided to enable the building of words as indicated by the chance selected letter and number for the starting play and by chance selected numbers to form subsequent words. The second word is formed at a right angle to the first word, the initial letter of which is the last letter of the preceding word, subsequent words are formed at a right angle to the preceding word in like manner. The words formed must have an associated thought suggestion with the preceding word.

3,606,337
POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

Laurie Edward Larsen, Auburn, New South Wales, and Roger Mark Michie, Wentworthville, New South Wales, Australia, assignors to Standard Telephones and Cables Pty, Limited, Alexandria, New South Wales, Australia

Filed Mar. 24, 1969, Ser. No. 809,511
Int. Cl. A63f *1/18*
U.S. Cl. 273—143R **12 Claims**

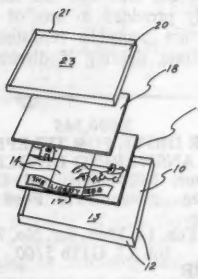


A poker machine of the type having five reels on which indicia of cards are displayed and winning combinations determined according to particular combinations displayed in a window characterized by coding each of the reels on a side surface thereof with electrical information in digital form corresponding to the indicia on the adjacent periphery. The digital information of the stopped reels is fed to a logic unit to determine the presence of winning combinations and cause the appropriate pay off.

3,606,338
METHOD OF PREPARING A COMPLETED JIGSAW PUZZLE FOR FRAMING

James V. Cannata, 48 Green Pond Road, East Falmouth, Mass. 02536

Filed May 13, 1969, Ser. No. 824,139
Int. Cl. A63f *9/10*
U.S. Cl. 273—157 **3 Claims**

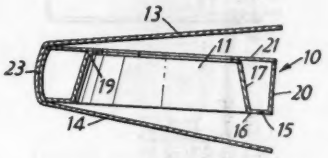


A completed jig-saw puzzle in a first receptacle having sides, receives a flat support plate on its picture face surface, another receptacle having sides is placed on said plate, the assembly is turned upside down, and said first receptacle is removed. The support plate with the puzzle on it, picture-face down, is placed in the first receptacle, an adhesive is provided on the face surface of said other receptacle and the latter is pressed onto the back surface of the puzzle, thus uniting the two, which are then ready for transfer to a picture frame.

3,606,339
GOLF PRACTISING DEVICES

Keith B. Marshall, Fawkham, Kent, England, assignor to Dependable Electronic Equipment Limited, London, England

Filed Nov. 29, 1968, Ser. No. 780,121
Claims priority, application Great Britain, Oct. 21, 1968, 49,862/68
Int. Cl. A63b *57/00*
U.S. Cl. 273—180 **4 Claims**



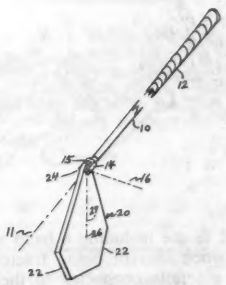
A golf practising device comprising a body having a hole extending completely through it, which hole has a larger diameter at one end than the other, and two lids pivotally attached to the body on opposite sides thereof.

The body and lids may simulate the appearance of a book. The holes may be used as putting cups and the lids as ramps extending toward the holes. The body may be made by vacuum molding one sheet of material to form an apertured flanged member and securing a face forming apertured sheet to the flange portion thereof.

3,606,340
PRACTICE GOLF DEVICE

Ralph H. Tiller, 455 W. K St., Brawley, Calif. 92227

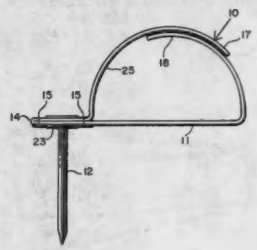
Filed Feb. 13, 1970, Ser. No. 11,260
Int. Cl. A63b *69/36*
U.S. Cl. 273—186A **4 Claims**



A golf "club" for practice swings has the usual club head replaced by a mass eccentrically pivoted for free swinging movement on a pivot axis perpendicular to the length of the shaft and parallel to the swing direction. The mass is freely swingable through a range of positions that include the position wherein the center

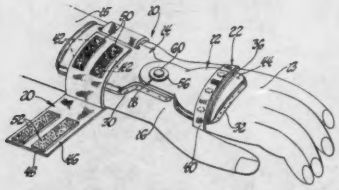
of gravity of the mass is aligned with the shaft. The mass may take the form of a flat blade and it may include a lofted portion which can be used effectively for hitting a golf ball. Certain swing errors are signalled to the player by dynamic reaction of the mass.

3,606,341
GOLFER'S FOOT HOLDING DEVICE
Harlan V. Honbarger, Miami, Fla.
(2350 NW. 81 Ave., Sunrise Golf, Valley, Fla. 33313)
Filed Feb. 20, 1970, Ser. No. 13,048
Int. Cl. A63f *69/36*
U.S. Cl. 273—188R 3 Claims



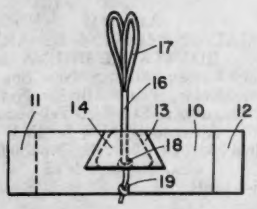
A golfer's foot holding device consisting of an elongated pliable member adapted to be wrapped about the golfer's lead foot and having a spike attached to a folded midportion thereof for securing the device to the ground whereby the golfer's foot is held in position while he is permitted to shift his weight and lift his heel in executing a proper golf swing. A pair of washers disposed on opposite sides of the head of the spike are sandwiched between the folded midportion and a pliable securing member.

3,606,342
WRIST CONTROL DEVICE
Stanley E. Albertson, Jr., 34037 Burton Lane, Livonia, Mich. 48154
Filed June 30, 1969, Ser. No. 837,663
Int. Cl. A63b *69/36*
U.S. Cl. 273—189R 21 Claims



A wrist control device including a hand member having at least a portion thereof being frusto-conical and an arm member pivotally connected to the hand member. A plate is pivotally connected to the top surface of the hand member, and a first strap means is connected to the plate so that the device may be utilized on either the right or left hand. A second strap means is connected at one end to the top surface of the hand member and extends about the opposite side and through a slot in the hand member and then back about the opposite side to a second end. The first and second strap means are respectively removably connected to the respective members and each have coacting means at the respective ends thereof for releasably connecting the ends of the respective strap means together. A cushioning material is disposed on the under surfaces of the respective members.

3,606,343
WRIST RESTRAINT FOR GOLFERS AND BOWLERS
George E. Lemon, 286 Lora Ave., Youngstown, Ohio 44504
Filed Apr. 4, 1969, Ser. No. 813,546
Int. Cl. A63b *69/36*; A63d *5/00*
U.S. Cl. 273—189R 2 Claims



A wrist restraint and hand tensioning device for use by golfers and bowlers. A wrist encircling band of elastic or cloth is provided. Finger-encircling loops are connected to one end of a cord which extends along the back of a hand to the wrist encircling band. A flat retaining plate is held in a pocket on the band and engages the free end of the cord which is provided with a series of knots.

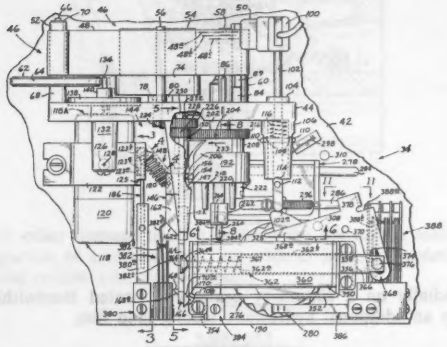
3,606,344
SET OF PROTECTIVE SHROUDS FOR GOLF TEES
Robert J. Ball, 2846 Santa Anita, Altadena, Calif. 91001
Filed May 28, 1969, Ser. No. 828,631
Int. Cl. A63b *51/00*
U.S. Cl. 273—202 4 Claims

A golf tee and club protector comprising a soft resilient ring sized to telescope about and grip the lower head portion of a golf tee and to have its lower end bear against the ground to aid in supporting the golf tee at a desired playing height. The protector safeguards both the face of the club and the tee against damage and is preferably provided in sets of assorted lengths. The protectors are reusable repeatedly and brightly colored to facilitate sighting if displaced by the club in play.

3,606,345
TAPE DRIVE FOR TELEPHONE ANSWERING DEVICE
James F. Cranor, Milwaukie, and Claude M. Faust, Portland, Oreg., assignors to Ford Industries, Inc., Portland, Oreg.
Filed Feb. 14, 1969, Ser. No. 799,381
Int. Cl. G11b *5/00*
U.S. Cl. 274—4R 5 Claims

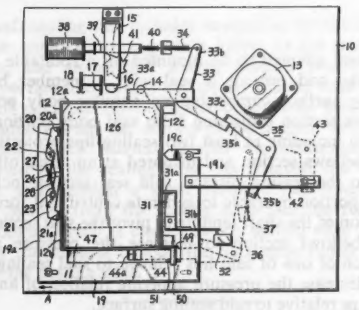
A telephone answering device, wherein tape support mechanism supports a magnetic tape for reversible movement past a recording and playback head, with drive for

the mechanism supplied by a motor which is moved alternatively to two different positions drivingly engaging the mechanism to produce reversible operation thereof. The motor is moved to such different positions automatically by a toggle assembly which is driven by the motor through



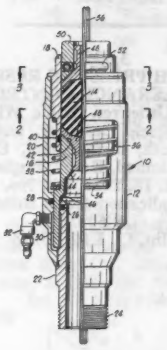
the tape support mechanism. The recording and playback head is mounted for shifting to different selected positions transversely of the tape, and mechanism is provided which automatically shifts the head at appropriate times.

3,606,346
AUTOMATIC TAPE CARTRIDGE PLAYER
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Victor Company of Japan Limited, Yokohama, Japan
Filed Mar. 17, 1969, Ser. No. 807,617
Claims priority, application Japan, Mar. 15, 1967 (utility model), 42/22,330; Apr. 12, 1967 (utility model), 42/31,269; Mar. 19, 1968, 43/17,524 (utility model), 43/21,108; Dec. 13, 1968, 43/90,997; Dec. 31, 1968 (utility model), 44/1,662
Int. Cl. G11b *5/00*
U.S. Cl. 274—4F **4 Claims**



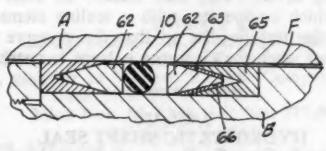
An automatic tape cartridge player comprising a magnetic head for reproducing and playing a lowermost tape cartridge out of a plurality of tape cartridges loaded in layers in a casing, a cam-operated lever means for dropping and discharging or releasing said lowermost tape cartridge after termination of playing from its loaded position, and cam-operated lever means for supporting the loaded cartridges other than the discharged one during operation of the discharging means. One of said loaded cartridges immediately above the discharged one is then dropped to the lowermost position in the casing after operation of said discharge means.

3,606,347
WIRELINE WIPERS
Norman W. Read and Morgan L. Crow, Dallas, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 28, 1969, Ser. No. 803,227
Int. Cl. E21b *33/00;* **F16j** *9/00, 15/00*
U.S. Cl. 277—2 **10 Claims**



A wiper assembly is disclosed herein that is useful in connection with a wireline that extends into a conduit located in a well bore or the like. The wiper assembly includes a body that is adapted for connection with the conduit in encircling relationship to the wireline. A deformable wiping element is positioned in the body and is arranged to be deformed into sealing engagement with the body and with the wireline. To deform the wiping element, a piston is slidingly positioned in the body and has an upper end that engages, in non-sealing relationship, the wiping element. The piston is arranged to be moved in the body in response to a fluid pressure exerted thereon. The piston is also arranged so that the well pressure, to which the piston is exposed, either has no effect on the piston or is arranged whereby the well pressure tends to move the piston into tighter engagement with the wiping element.

3,606,348
SEALS
Arthur T. Taylor, 2102 Crosby Road, Carrollton, Tex. 75006
Filed Mar. 11, 1970, Ser. No. 18,628
Int. Cl. F16j *15/00*
U.S. Cl. 277—26 **25 Claims**



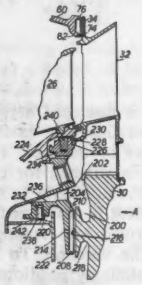
Seal assemblies having a primary initial seal means operative for sealing between two members at varying conditions of pressure at normal temperatures below a predetermined elevated temperature, and secondary

malleable metallic seal means which is movable by fluid pressure acting through the primary seal to provide a metal to metal seal between said members upon occurrence of a temperature at said seal assemblies equal to or in excess of said predetermined elevated temperature. Means is provided for holding or restraining the secondary seal means in non-sealing position until the occurrence at least of the predetermined elevated temperature, and which is yieldable or releasable to permit said secondary seal means to be moved to an effective sealing position by the pressure acting on said primary seal prior to destruction or damage of primary seal as a result of the elevated temperature. Several types of primary and secondary seals are illustrated.

3,606,349
SEAL WITH PRESSURE RESPONSIVE TOLERANCE CONTROL

James A. Petrie, Littleover, Willie Williamson, Shelton Lock, Thomas Steel, Littleover, and James I. Hammond, West Heath, Birmingham, England, assignors to Rolls Royce Limited, Derby, England

Filed Sept. 16, 1969, Ser. No. 858,325
Claims priority, application Great Britain, Aug. 7, 1969, 39,609/69
Int. Cl. F16j 15/16
U.S. Cl. 277—27 **3 Claims**



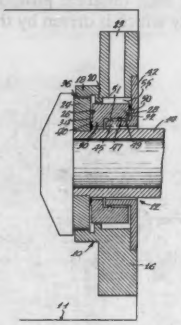
A sealing device mounted for axial movement on a stationary portion of a gas turbine engine and arranged to seal against the upstream face of the high pressure turbine of the engine. The sealing device is annular in form and has two lips defining an annular channel and a number of radial lands extending between the lips thereby defining a plurality of equi-spaced recesses. In operation, the recesses in combination with the turbine disc form a number of chambers which are subjected to a variable pressure, the chambers being in communication with a source of high pressure gas. If the clearance between the sealing device and the turbine disc decreases the pressure in the chambers increases and vice-versa, the resultant pressure on the sealing device acting to maintain the clearance at a substantially constant value. The sealing device may also include an axial sealing element which co-operates with a sealing element provided on the turbine disc so that the pressure loss in the chamber when the clearance is large is restricted.

3,606,350
HYDROSTATIC SHAFT SEAL

Homer E. Gravelle, Denver, Colo., assignor to Sundstrand Corporation

Filed July 2, 1969, Ser. No. 838,496
Int. Cl. F16j 15/34
U.S. Cl. 277—27 **6 Claims**

A hydrostatic shaft seal including an annular sealing ring rotatable with the shaft having a radial sealing surface adjacent to a stepped hydrostatic sealing surface on a floating freely rotatable nosepiece that is centered

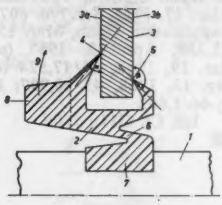


radially on a stationary centerpost located therewithin by an additional hydrostatic sealing fluid film.

3,606,351
SEAL FOR CIRCULAR SLOTS

Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden

Filed Oct. 31, 1969, Ser. No. 872,810
Claims priority, application Sweden, Nov. 8, 1968, 15,176/68
Int. Cl. F16j 15/42, 15/54
U.S. Cl. 277—25 **5 Claims**



A seal adapted to be mounted on a rotatable shaft or the like and provide a seal with a member having a sealing surface comprising an annular body portion, a bellows section projecting from said body portion, a seal section including at least two sealing lips projecting from said bellows section and disposed at an angle other than 90° to the sealing surface, said seal section including a mass portion operable to generate centrifugal forces upon rotation of the shaft tending to pivot the seal section about said bellows section to increase the pressure applying relation of one of said lips relative to said sealing surface and decrease the pressure applying relation of another of said lips relative to said sealing surface.

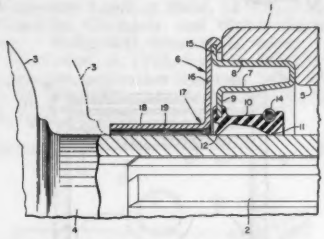
3,606,352
FLUID SEAL ASSEMBLY

Walter A. Lutz, Lexington, Ky., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 18, 1969, Ser. No. 817,319
Int. Cl. F16j 9/06; F02f 5/00
U.S. Cl. 277—32 **3 Claims**

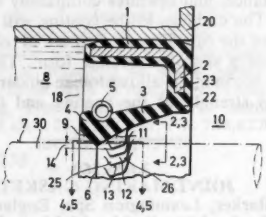
A fluid seal assembly having a sealing portion adapted to be mounted in a housing to make fluid sealing engagement with a reciprocating and/or rotating shaft which

extends into said housing, said assembly also having a rigid tubular shield portion which extends axially along said shaft to protect the latter from scratching, marring,



or other damage thus to prolong the life of the sealing portion of said assembly, but without impeding rotation and reciprocation of said shaft.

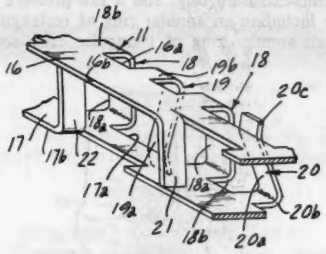
3,606,353
SEALING RING
Werner Heinl, Burscheid, Germany, assignor to Goetzewerke Friedrich Goetze A.G., Burscheid, Germany
Filed Apr. 3, 1969, Ser. No. 813,126
Claims priority, application Germany, Apr. 4, 1968, P 17 50 169.8
Int. Cl. F16j *15/32*
U.S. Cl. 277—134 **6 Claims**



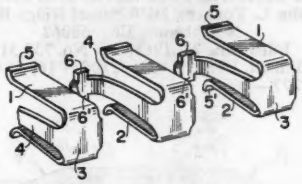
A shaft sealing ring includes an annular connecting portion, an annular sleeve portion joined to the connecting portion, and an annular sealing portion joined to the sleeve portion and having an annular sealing edge. A plurality of circumferentially distributed elastic tongues extend radially from the sealing portion. Each tongue has a portion which extends beyond the maximum radial dimension of the sealing edge. As a result the tongues engage with tension a shaft surface. The tongues are axially spaced from the sealing edge and the region of each tongue which is closest to the sealing edge extends radially the furthest beyond the maximum radial dimension of the sealing edge.

3,606,354
PISTON RING
Herbert F. Prasse, Town and Country, and Harold E. McCormick, Ballwin, Mo., assignors to Ramsey Corporation, St. Louis, Mo.
Filed Feb. 26, 1969, Ser. No. 802,351
Int. Cl. F16j *9/06, 15/56*
U.S. Cl. 277—140 **5 Claims**

A spacer-expander ring for piston oil ring assemblies which can be economically and easily manufactured in continuous strip form, rolled and cut into split rings of desired size and heat treated to snap into a closed continuous ring with a diameter less than the diameter of the piston for which it is intended. The ring is circumferentially continuous, its ends will not overlap and it has individual spring fingers at its innermost periphery to engage the inner peripheries of thin split rail rings supported thereon.



3,606,355
SPACER EXPANDER
Hiroshi Minegishi, Kawagoe-shi, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Filed Aug. 5, 1969, Ser. No. 847,651
Int. Cl. F16j *9/06*
U.S. Cl. 277—140 **4 Claims**

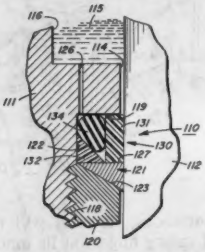


A channel type spacer expander is used with a pair of side rails as a piston ring of an internal combustion engine and takes the form of a discontinuous circle composed of a plurality of equally-spaced unitary channels having a C-shaped cross-section and is provided with a pair of projections at the outer edges thereof and a plurality of U-shaped bent portions, each disposed between the adjacent unitary channels. The connecting portion between the unitary channel and the U-shaped bent portion has curved edges to reinforce the connection therebetween. A pair of projections protrude on the opposite sides of the closed portion to prevent the associated side rails from deflecting in excess of 0.1 mm. The whole surface of the spacer expander is chrome-plated and/or the inner and outer peripheral surfaces of the associated side rails are then coated with poly-tetra-fluoride-ethylene to provide better mechanical properties.

3,606,356
HIGH-PRESSURE SEAL ASSEMBLY
John Edward Beroset, Alsace Township, Berks County, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Nov. 19, 1968, Ser. No. 777,061
Int. Cl. F16j *15/40*
U.S. Cl. 277—165 **9 Claims**

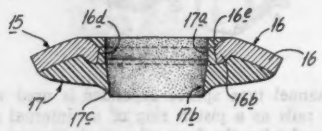
This disclosure is directed to a high-pressure seal assembly which is useful for preventing leakage of a high pressure fluid through the interface between a housing and a member extending therethrough, particularly where the housing and member are movable relative to each

other, e.g. a piston movable into a pressure vessel for pressurizing fluid contained therein. A high-pressure seal assembly according to the present disclosure may include a high-pressure seal sub-assembly including an annular beveled anti-extrusion ring; and a low-pressure seal sub-assembly including an annular ring of rectangular cross-section, an annular ring of triangular cross-section and



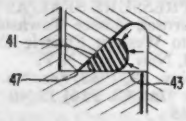
a resilient O-ring, all mounted in an annular channel on the high pressure side of the anti-extrusion ring. This disclosure is also directed to an anti-extrusion ring with taper angles which provide improved results with regard to frictional engagement between the anti-extrusion ring and a fluid pressurizing piston, and with regard to tolerance to wear of the anti-extrusion ring.

3,606,357
SELF-SEALING AND ALIGNING MEMBER
John L. Yonkers, 2030 Sunset Ridge Road, Northbrook, Ill. 60062
Filed June 24, 1968, Ser. No. 739,314
Int. Cl. F16b *35/00, 43/00;* **F16j** *15/00*
U.S. Cl. 277—166 **10 Claims**



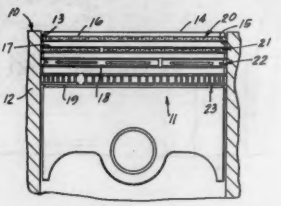
There is provided a self-sealing and aligning member including a generally concave washer provided with an inwardly turned flange, and a ring-shaped plastic filler joined to the concave side of the washer and defining a generally arcuate outer surface.

3,606,358
HIGH-PRESSURE SEALING DEVICES
Werner Tobler, Winterthur, Switzerland, assignor to Kistler Instruments AG, Winterthur, Switzerland
Filed Dec. 6, 1968, Ser. No. 781,807
Claims priority, application Switzerland, Dec. 6, 1967, 17,119/67
Int. Cl. F16j *15/06*
U.S. Cl. 277—170 **7 Claims**



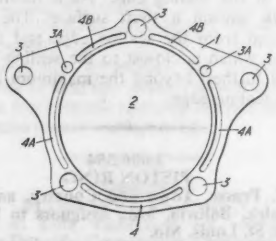
A high-pressure sealing arrangement for components which are provided with a lip portion defined by a groove and adapted to seat directly on the seating surface around the groove.

3,606,359
TUNGSTEN CARBIDE COATED PISTON RINGS
Harold E. McCormick, Ballwin, Mo., assignor to Ramsey Corporation, St. Louis, Mo.
Filed Aug. 8, 1969, Ser. No. 848,623
Int. Cl. F16j *9/00*
U.S. Cl. 277—224 **10 Claims**



Piston rings, including compression and oil control rings, for internal combustion engine pistons, having a bearing face of an alloy formed in situ on the ring from a plasma jet stream. The alloy is composed of refractory metal carbides such as tungsten carbide in solid solution with another metal, such as cobalt, to provide a hard wear phase with the carbide particles relatively free from sharp edges and corners and a somewhat softer matrix phase composed of metals such as nickel, chromium, boron, and aluminum. The aluminum should be present in a minor amount such that even minor scuffing of engine cylinders is avoided. The coating is very hard and refractory, possesses a higher tensile strength than heretofore used piston ring facings, does not scuff, has improved abrasive wear resistance, and operates compatibly with the engine cylinders. The carbides in the coating will not pull out in operation of the ring because they are in solid solution and do not have a sharp particulate form. The nickel, chromium and boron in the alloy provide binders improving the mechanical strength of the coating and the hardness of the matrix.

3,606,360
JOINT-MAKING GASKETS
John R. Barker, Leamington Spa, England, assignor to British Leyland (Austin-Morris) Limited (formerly The British Motor Corporation Limited), Longbridge, Birmingham, England
Filed Oct. 8, 1969, Ser. No. 864,800
Claims priority, application Great Britain, Oct. 15, 1968, 48,701/69
Int. Cl. F16j *15/08, 15/14*
U.S. Cl. 277—227 **1 Claim**



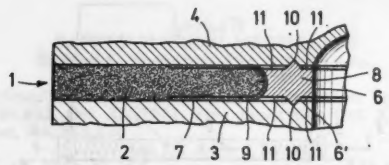
A joint comprises a sealing gasket provided with bolt holes and slots in areas between the bolt holes subjected to less clamping pressure than the areas around the bolt holes. The slots are filled with a fluent sealing compound.

3,606,361

FLAT GASKET FOR THE CYLINDER HEAD OF COMBUSTION ENGINES AND PROCESS FOR MAKING SAME

Ulrich Pohl, 40 Lerchenauerstrasse, 8 Munich 13, Germany; Otto Stulle, 214 Parksiedlung, 8042 Oberschleissheim, Germany; Lambert Riehl, 52 Augsburgerstrasse, 7910 Neu-Ulm, Germany; and Walter Stadelmann, 1 Zimtweg, 7 Stuttgart-Heumaden, Germany.

Filed Mar. 14, 1969, Ser. No. 807,220
Claims priority, application Germany, Mar. 15, 1968, P 16 75 356.3; May 14, 1968, B 75,755; Nov. 29, 1968, P 18 11 789.0
Int. Cl. F16j *15/06*
U.S. Cl. 277—235B 10 Claims



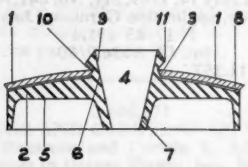
A flat cylinder head gasket includes a sealing ring, formed as a split ring, around at least one opening, with a metal shield surrounding the split ring and, when inserted in place, causing the abutting ends of the split ring to be tightly joined together. The sealing ring is formed by stretching and winding a profiled wire on a helical form and cutting the helix in a longitudinal direction, and the rings are radically compressed by the inward deformation of the surrounding metal shield.

3,606,362

SEALING WASHERS

Sydney J. Wainstein and Bernard M. Sherman, Johannesburg, Transvaal, Republic of South Africa, assignors to National Plant Hire (Proprietary) Limited, Jeppe, Johannesburg, Transvaal, Republic of South Africa

Filed Dec. 20, 1968, Ser. No. 785,627
Int. Cl. F16j *15/00*
U.S. Cl. 277—235 7 Claims



A sealing washer assembly for the retention of cladding material to building frames and particularly roof structures consisting of the combination of a metal outer washer with a resilient liner wherein the two parts are held together by resilient engagement of a part of the liner with a suitable edge portion of the metal washer.

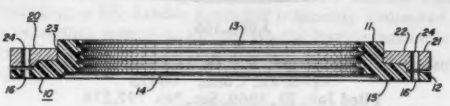
3,606,363

INTERNALLY THREADED SEAL

James F. Jordan, Orchard Park, N.Y., assignor to Bethlehem Steel Corporation

Filed Dec. 23, 1969, Ser. No. 887,604
Int. Cl. F16j *15/16*
U.S. Cl. 277—237 3 Claims

An internally threaded seal for sealing between a rotating threaded shaft and a stationary body containing a threaded bore. The seal is threadably connected to the shaft and fastened to the stationary body. The seal performs two functions: (a) prevents contamination of lubricated moving parts contained within the stationary body, and (b) retains lubricant within the stationary body.

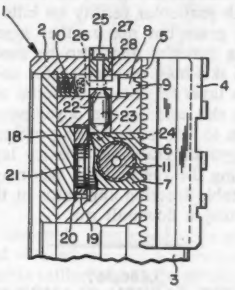


3,606,364

JAW CHUCK IMPROVEMENTS

Milton L. Benjamin and Wilbur N. Miles, Chagrin Falls, Ohio, assignors to Erickson Tool Company, Solon, Ohio

Continuation-in-part of application Ser. No. 781,460, Dec. 5, 1968. This application Aug. 13, 1969, Ser. No. 863,736
Int. Cl. B23b *31/16*
U.S. Cl. 279—121 9 Claims



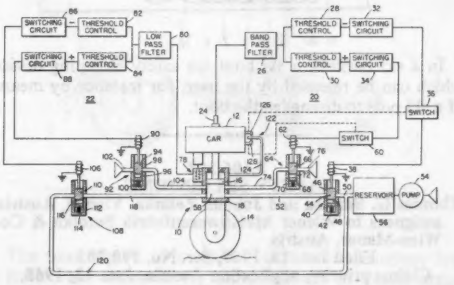
Jaw chuck embodying automatic lock means which must be manually released from the jaws before the latter may be radially adjusted or removed from the chuck body for turning end for end or for replacement.

3,606,365

ACTIVE SUSPENSION SYSTEM FOR A VEHICLE

Philip M. Strong, Philadelphia, Pa., assignor to The Budd Company, Philadelphia, Pa.

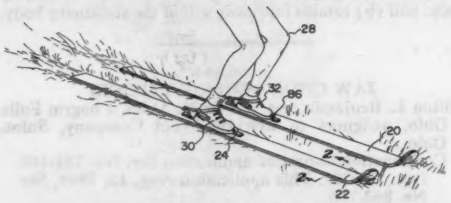
Filed Nov. 3, 1969, Ser. No. 873,261
Int. Cl. B60g *17/04*
U.S. Cl. 280—6H 9 Claims



An active suspension system includes a fluid operated piston to compensate for irregular movements of a main body of a vehicle. A detector detects the movement of the body out of a predetermined plane of movement and

controls the amount of fluid actuating the piston to maintain the body close to its predetermined plane as it is moved.

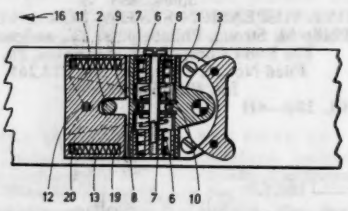
3,606,366
SUMMER SKIS
Joseph F. Engelberger, R.F.D. 1, Taunton Hill Road, Newtown, Conn. 06475
Filed Jan. 21, 1969, Ser. No. 792,274
Int. Cl. A63c 5/04
U.S. Cl. 280—11.1 **11 Claims**



A modified form of skiing is achieved at any time of the year and in any climate by providing a layer of ice on the bottom of the ski which is of sufficient thickness to last for a substantial downhill run. The ice coated skis can be used with particular facility on hills that are covered with long grass but many other types of natural ground covering material may also be used.

Conventional skis may be adapted for such use by the application of a layer of suitable material to the running surfaces of the skis and by the development of an icy layer that clings to this material and presents a slippery surface to the ground covering. The icy layer will wear off or melt during the run and the skis may be recoated with ice by suitable freezing apparatus at the top of the hill before starting a downhill run.

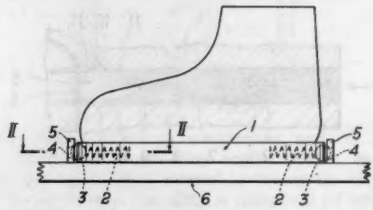
3,606,367
SKI BOOT TOE SAFETY CLAMPING DEVICE
Georges P. J. Salomon, 34 Avenue de Loverchy, Annecy, Haute-Savoie, France
Filed Jan. 3, 1969, Ser. No. 788,759
Claims priority, application France, Jan. 10, 1968, 13,561
Int. Cl. A63c 9/04
U.S. Cl. 280—11.35T **9 Claims**



In a ski harness, a ski boot toe safety clamping device which can be released by the user, for instance by means of a ski pole to disengage the boot.

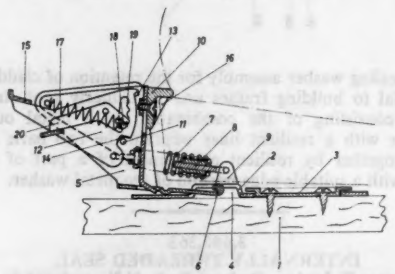
3,606,368
SAFETY SKI BINDING
Thomas G. Smolka and Johann Zelinka, Vienna, Austria, assignors to Wiener Metallwarenfabrik Smolka & Co., Wien-Mauer, Austria
Filed Jan. 13, 1969, Ser. No. 790,705
Claims priority, application Austria, Jan. 12, 1968, 348/68
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35D **11 Claims**

A safety ski binding in which pairs of releasable members are arranged at either or both of the toe and heel of a ski shoe, one part of said locking members being arranged on the ski and the other part being arranged on, or as a part of, the ski shoe. One preferred form contemplates the location of tensioned releasable means within the sole of the ski shoe and the part against which said tensioned means operate being mounted on the ski. Alternatively, the tensioned releasable means may be mounted primarily within the ski with a sole gripping portion projecting therefrom and arranged for engaging the sole of the ski shoe. In the first-named form, recess means are mounted fixedly, or longitudinally adjustably as desired, onto the ski and projecting means are mounted



at least partially within the ski shoe and projecting outwardly therefrom for engaging said recess means, said projecting means being resiliently urged into engaging position but retractible in response to pressure applied thereto. Where said tensioned releasable means are provided at both ends of the ski shoe, same may be independently adjustable or common means may be provided for simultaneously adjusting the tension on both of said tensioned releasable means. Similarly, connecting means may be provided between tensioned releasable means at both the toe and heel of the ski shoe whereby the release effected at either thereof will mechanically and positively release the other.

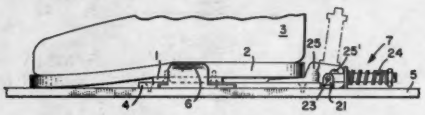
3,606,369
ARRANGEMENT FOR CONNECTING A SKI BOOT TO A SKI
Heinz Batal, Ruckersdorf, Germany, assignor to Carl Braun Camera-Werke, Nuremberg, Germany
Filed July 14, 1969, Ser. No. 841,369
Claims priority, application Germany, July 25, 1968, P 17 03 891.4
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35T **5 Claims**



In the context of a safety arrangement for connecting a boot with a ski, comprising a heel holding means which can be swung so as to fit over an edge of the heel of the boot, and automatically snaps into position on placing

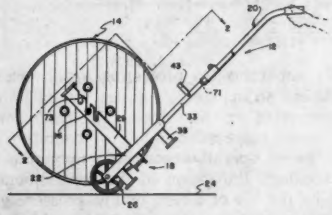
the boot in the arrangement and automatically releases the boot on an excessive load being applied, and an opening part which can be actuated by hand for opening the arrangement for release of the boot, the present improvement provides that the heel holding means extends below and behind the heel of the boot, and in that the arrangement includes a pin by which the heel holding means is connected below the heel of the boot in such a manner as to allow tilting, a swivel plate attached to the ski and having a recess running in the direction of the ski, the heel holder being attached in the recess and elastic connecting parts for fixing the heel holder in the longitudinal direction of the ski.

3,606,370
SAFETY BINDING MECHANISM
Richard G. Spademan, 933 Addison Ave., Palo Alto, Calif. 94301
Continuation-in-part of abandoned application Ser. No. 769,682, Oct. 22, 1968. This application Oct. 7, 1969, Ser. No. 868,271
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35T 11 Claims



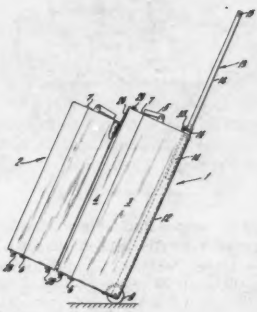
A safety binding for use with snow skis and boots consisting of two separable but coacting parts comprising a lever mechanism and a rigid fixed plate. The plate and lever mechanism are each adapted to engage or be engaged by cooperating elements of the other. The lever mechanism comprises a moveable longitudinally-extending spring-biased connecting strip having a wedge shaped end which mates freely with conforming surfaces of a pivotable lever. As the strip is moved, the lever is caused to pivot so as to engage or be engaged by the rigid fixed plate for providing a releasable connection between the plate and the lever mechanism which resists all degrees of relative movement between the ski boot and ski without the necessity of a toe restraining device. The lever mechanism can be mounted in the sole of the booth with the fixed plate mounted on the ski or alternatively the mounting of the parts may be reversed.

3,606,371
STORAGE AND CARRYING APPARATUS
Kenneth E. Rousseau and Corwin E. Adams, Wichita, Kans., assignors to Harper Trucks, Inc., Wichita, Kans.
Filed Aug. 25, 1969, Ser. No. 852,781
Int. Cl. B62b *1/20, 1/22*
U.S. Cl. 280—47.24 4 Claims



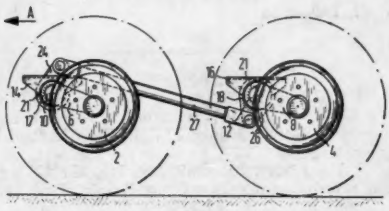
This invention is a storage and carrying apparatus operable to convey items such as a cable or hose reel and readily converted from a storage condition to the usage condition through lift and storage means. More particularly, this invention is a support and conveyance means operable to be moved through lift and storage means including a lift handle assembly releasably connected to a connector assembly whereupon the handle assembly is readily movable from a horizontal lift condition to an upright storage condition.

3,606,372
WHEELED LUGGAGE
Arthur J. Browning, Downers Grove, Ill. (P.O. Box 234, R.R. 7, Mount Vernon, Ill. 62864
Filed May 21, 1969, Ser. No. 826,405
Int. Cl. B62b *1/04*
U.S. Cl. 280—47.17 15 Claims



A luggage ensemble comprised of a plurality of suitcases provided with wheels and a retractable handle. The luggage ensemble utilizes the shape of respective suitcases and means, such as a strap or belt, to retain them in secured relationship and to facilitate storage in conventional terminal lockers.

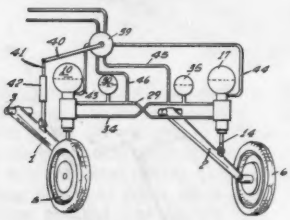
3,606,373
TANDEM WHEEL UNDERCARRIAGE
Valentin Knott, 15 Obinger Strasse, 8201 Eggstatt, Germany, and Ernst Pelzl, 79 Hembof, 8201 uber Rosenheim, Germany
Filed Aug. 25, 1969, Ser. No. 852,818
Int. Cl. B60g *19/02*
U.S. Cl. 280—104.5 6 Claims



The four wheels of a tandem wheel undercarriage for a trailer are mounted on the free ends of radial arms projecting from outer ends of individual shafts, the inner ends of each pair of shafts being received in a tubular member. Annular rubber torsion springs connect the inner shaft ends to the enveloping tubular member and the outer shaft ends to bearing blocks on the undercarriage

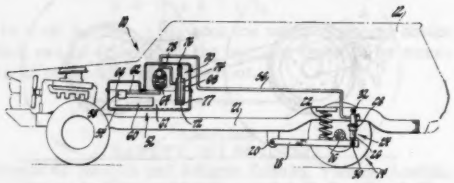
frame in which the outer shaft ends are rotatably received. The radial arms normally extend obliquely downwardly and rearwardly from the associated shafts in a common direction. The two tubular members are coupled by two rods hinged to lugs on the tubular members in such a manner that the tubular members turn simultaneously in opposite directions about their axes.

3,606,374
SELF-ADJUSTING HYDRO-PNEUMATIC SUSPENSION
Rene Capgras, Paris, France, assignor to Whittaker Corporation, Los Angeles, Calif.
Filed Mar. 19, 1969, Ser. No. 808,399
Int. Cl. B60g *19/04*
U.S. Cl. 280—112 **4 Claims**



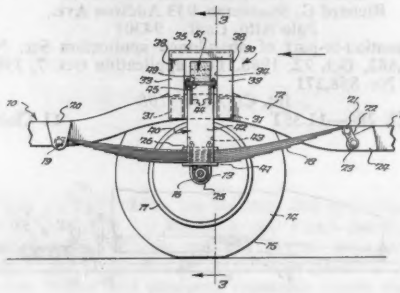
A pneumatic suspension system for a motor vehicle having a pair of laterally spaced road wheels, the system comprising a respective piston-and-cylinder assembly connected between each of the wheels and the vehicle body, each of the assemblies having a cylinder and a triple-acting differential piston slidable in the cylinder and subdividing the same into a first chamber, a second chamber and a third chamber, respective main gas cushions communicating with said first chamber of said assemblies, respective conduit means connecting the second chamber of the assemblies with the third chamber of the other assembly, a pair of auxiliary gas cushions, each connected with a respective one of the conduit means, and a hydraulic distributor responsive to the spacing between the body and the ground surface for modifying the fluid pressure in the chambers to maintain the vehicle height substantially constant.

3,606,375
ELECTRIC CONTROLLER FOR VEHICLE LEVELING SYSTEM
George W. Jackson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 23, 1970, Ser. No. 5,230
Int. Cl. B60g *17/00*
U.S. Cl. 280—124 **8 Claims**



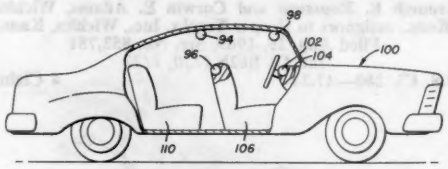
In preferred form, a controller for a vehicle leveling system that has an auxiliary load-supporting air spring for maintaining a vehicle height. An electrical switch is mounted on the air spring and is responsive to the height of the vehicle chassis to selectively control either energization of an electric motor driven compressor to exhaust or pump-down the air spring or energization of a solenoid controlled valve to communicate a storage tank with the air spring during a pump-up or inflation phase of operation. The switch includes a pressure sensing chamber in communication with the air spring and a pressure responsive piston operated by pressure in the air spring to condition the switch to shut-off the compressor.

3,606,376
SECOND STAGE SPRING SUSPENSION
Albert F. Hickman, 8009 N. Gowanda State Road, Eden, N.Y. 14057
Continuation-in-part of application Ser. No. 641,000, May 25, 1967. This application July 22, 1969, Ser. No. 843,727
Int. Cl. B60g *9/04, 11/40*
U.S. Cl. 280—124RS **4 Claims**



As a helper spring for the rear end of a conventional through axle pick-up truck or the like, a frame and an axle bracket have base parts secured at each axle end, intermediate parts extending along the inner side of each wheel, and end parts adjacent and preferably radially in line with and above the tire treads. A resilient rubber body, preferably acted on in generally vertical compression to expand and contract horizontally, is interposed between each pair of these end parts, and preferably are located to provide high and widely spaced spring centers for stable support of the load on the truck.

3,606,377
VEHICLE CRASH RESTRAINT SYSTEM
Robert L. Martin, Detroit, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 4, 1968, Ser. No. 773,269
Int. Cl. B06r *21/10*
U.S. Cl. 280—150AB **3 Claims**



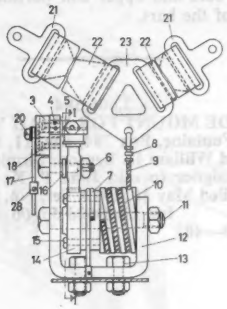
Safety apparatus for protecting an occupant of a vehicle during an acident comprises an inflatable confinement supported on the vehicle. The confinement is supported in an inoperative collapsed condition and is expanded to an operative condition upon the occurrence of an accident. Expansion of the confinement is accomplished by the use of a zero or low pressure gas generating reaction within the confinement which is initiated upon the occurrence of an accident. Cooling means may be employed to absorb the heat resulting from combustion of the fluid generating material.

3,606,378

INERTIAL ELECTROMAGNETIC LOCKING MECHANISM FOR SAFETY BELTS IN MOTOR VEHICLES

Luka Prostran, 50 Jakuba Kuburovica, Zemun-Beograd, Yugoslavia

Filed June 18, 1969, Ser. No. 834,395
Int. Cl. B60r 21/10
U.S. Cl. 280—150 4 Claims



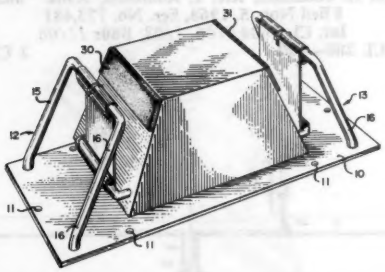
The holder of a safety belt is connected to a cable which is wrapped around a spring-loaded drum which is rotatably supported on a carrier attached to a vehicle such that the holder can be moved towards and away from the carrier by winding and unwinding of the cable on the drum. A toothed member rotates with the drum and is engageable by a spring loaded pawl to lock the drum when the pawl is acted on by an energized electromagnet, the latter being energized by closing of a switch of an energizing circuit by a swinging pendulum when the vehicle acceleration or deceleration exceeds a predetermined magnitude.

3,606,379

STABILIZED MOTOR VEHICLE AND STABILIZING DEVICE THEREFOR

William E. Anglin and Paul E. Anglin, Dallas, Tex., assignors to William E. and Paul E. Anglin and Trammell Crow Investment Company, all of Dallas, Tex., fractional part interest to each

Filed July 31, 1969, Ser. No. 846,480
Int. Cl. B60m 27/00
U.S. Cl. 280—150D 14 Claims



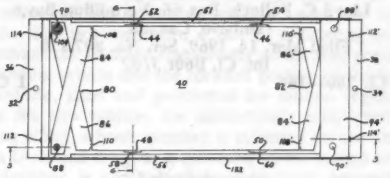
A stabilized, wheeled motor vehicle using a pair of pendulum-like weight masses so positioned as to provide a new geometry of stability for such vehicles. The invention also involves a new and improved stabilizing device. This device includes a base mounting plate or frame from which project upwardly a pair of spaced supporting brackets. A heavy weight mass is suspended from these brackets for swinging movement longitudinally only of the base plate. The pair of pendulum-like masses are positioned on the floor of the vehicle body as closely as possible to the rear corners, with the base plates positioned transversely of the longitudinal axis of the vehicle. The swinging pendulum movement of the weight masses thus takes place transversely of the vehicle body, with no fore and aft movement. The spaced units so placed balance and stabilize the vehicle, providing positive control during blow-outs, wet surface skids, emergency stops, and vehicle sway caused by soft shoulders and rough road surfaces, preventing or reducing vehicle skidding.

3,606,380

VEHICLE STABILIZING DEVICE

James W. Lewis, 218 Barber St., Edwardsburg, Mich. 49112

Filed Nov. 24, 1969, Ser. No. 879,444
Int. Cl. B60r 27/00
U.S. Cl. 280—150D 8 Claims



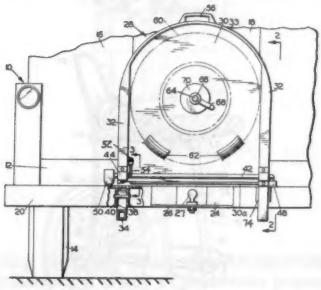
A vehicle stabilizing device in which a weight is mounted on a base for linear reciprocating movement in response to rear end centrifugal forces of the vehicle. A resilient means including two crossed levers pivotally connected to the base at each end of the weight transmits the counteracting forces of the weight to the base and thence to the vehicle. Springs may be interposed between the levers and base or between the weight and levers to enhance the resiliency of the reacting lever means.

3,606,381

COMBINATION SPARE WHEEL HOLDER AND STEP FOR PICKUP TRUCKS

George J. Betz, 4720 NE. 31st Ave., Portland, Oreg. 97211

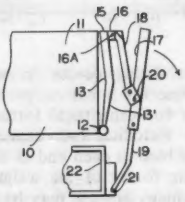
Application May 31, 1968, Ser. No. 736,926, now Patent No. 3,507,514, dated Apr. 21, 1970, which is a continuation-in-part of application Ser. No. 654,776, July 20, 1967. Divided and this application June 12, 1969, Ser. No. 870,719
Int. Cl. B60r 3/02
U.S. Cl. 280—164 6 Claims



A wheel holder has a threaded lug and supporting arm for securing a spare wheel flatwise thereagainst. This holder has lower extension capable of being pivotally connected to a utility bumper of a pickup truck. A spring-operated catch is used for maintaining the wheel holder

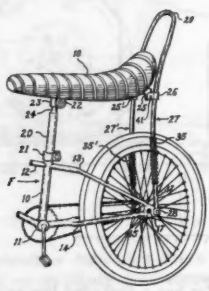
in a vertical position and when released allows the holder to lower to a horizontal position. The vertical supporting position of the body member comprises the normal or traveling position, and the horizontal position comprises a position for use as a step. In a first embodiment the spring catch is engageable with a detent on the bumper for maintaining the holder in its vertical position and forms a part of a cross shaft having a foot lever for rotating the shaft to a release position of the catch. A second embodiment has a pair of bumper brackets to which the holder is pivotally attached. In this latter embodiment, the bumper brackets also pivotally support a pair of rods slidable in guide brackets on the holder and having compression springs supported thereon to oppose lowering rotative movement of the holder.

3,606,382
TRUCK TAIL GATE STEPS
Lloyd C. Pollock, Box 66, Vermillion Bay, Ontario, Canada
Filed Mar. 14, 1969, Ser. No. 807,170
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **1 Claim**



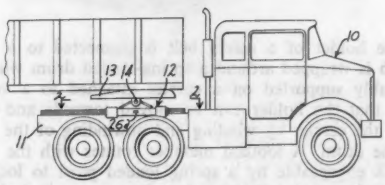
Folding steps attached to a truck tail gate and linked to the frame so that when the tail gate is lowered the steps unfold and when the tail gate is raised the steps fold up flush with the outer surface of the tail gate.

3,606,383
ADJUSTABLE BICYCLE SADDLE SUPPORTS
Robert H. Mesinger, Lakecrest Drive, Aunt Hack Ridge, Danbury, Conn. 06810
Filed June 11, 1969, Ser. No. 832,053
Int. Cl. B62j *1/02*
U.S. Cl. 280—283 **5 Claims**



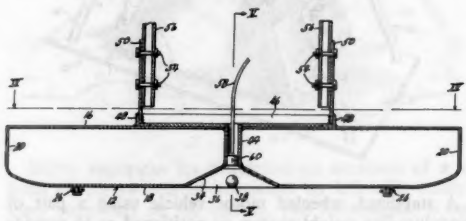
An elongated type bicycle saddle is vertically adjustably mounted on a bicycle frame by a vertically adjustable seat post secured under the front portion of the saddle and by support bars at the rear portion, the lower ends of the support bars being secured to the bicycle frame parts outside of the rear wheel, and the rear of the saddle being secured to the bars by clamps which encircle the bars, which clamps can be loosened and tightened to provide vertical positioning of the saddle along the bars. Preferably the bars include telescoping portions within coil springs that have lower ends secured to the lower parts of the bars and upper coil portions secured to the upper parts of the bars.

3,606,384
SLIDE MOUNT FOR FIFTH WHEELS
John P. K. Fontaine, Box 784, Rte. 11, Birmingham, Ala. 35210, and William D. Benson, Birmingham, Ala.; said Benson assignor to said John P. K. Fontaine
Filed May 18, 1970, Ser. No. 37,991
Int. Cl. B62d *53/06*
U.S. Cl. 280—407 **7 Claims**



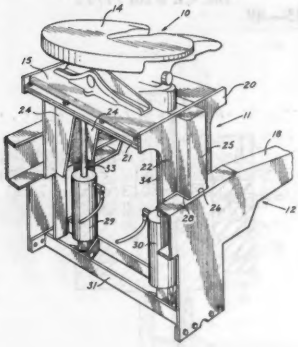
A slide mount for fifth wheels having a base frame mounted on the tractor and a slide mounted on the base frame and which carries the fifth wheel. The base frame rails carry individually formed spaced apart retainers providing tapered pockets to receive locking members, the locking members being carried by the slide and being spring biased to locking positions and operatively connected to a common handle for withdrawing them to free the slide for fore and aft movement.

3,606,385
COMBINATION MOTOR VEHICLE BUMPER
John H. Johannes, Rte. 1, Robinson, Kans. 66532
Filed Nov. 5, 1968, Ser. No. 773,481
Int. Cl. B60d *1/06, 1/08;* **B60r** *11/06*
U.S. Cl. 280—422 **2 Claims**



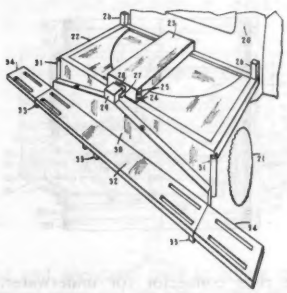
A bumper constituting a tool box adapted to be mounted at the rearward end of a truck in the position of and to perform the functions of a buffer, with a hitch and an electrical socket for trailers, farm implements and the like recessed in the rearward side thereof.

3,606,386
FIFTH WHEEL ELEVATABLE MOUNTING FOR TERMINAL TRACTOR
Russell John Dorn, Aurora, Colo., assignor to CEG Corporation
Filed May 11, 1970, Ser. No. 36,043
Int. Cl. B62d 53/08
U.S. Cl. 280—425 2 Claims



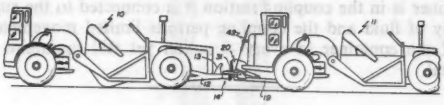
A terminal tractor for shuttling and spotting semi-trailers in a terminal or dock area is provided with an adjustably mounted fifth wheel structure. The fifth wheel is mounted on a carriage platform which is guided for vertical movement upon the tractor chassis by spaced rail engaging channels. Hydraulic lifting hoists are provided for raising and lowering the carriage platform and fifth wheel vertically to raise or lower the semi-trailer.

3,606,387
SELF-ADJUSTING CLOSE-COUPLED TRAILER HITCH
Delmer James Hill, Grosse Pointe Woods, Mich. (3133 Cortland Drive, Vestal, N.Y. 13850)
Filed May 29, 1969, Ser. No. 828,943
Int. Cl. B62d 53/00
U.S. Cl. 280—446 7 Claims



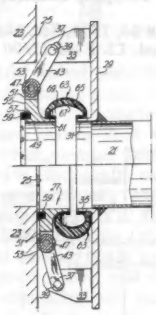
A device for towing mobile and sectional homes in a close-coupled manner when the longitudinal axes of towing vehicle and trailer are aligned, and automatically spacing the proximate surfaces of said towing vehicle and trailer in a turn, either way, up to 90°, to the extent necessary to preclude contact between said proximate surfaces.

3,606,388
VEHICLE COUPLING
Louis A. Campbell, 4632 1st St. SE., Box 5160 Postal Station A, Calgary 9, Alberta, Canada
Filed Mar. 4, 1969, Ser. No. 804,212
Int. Cl. B62d 53/00
U.S. Cl. 280—477 14 Claims



A push-pull hitch for coupling a pair of self-powered traction vehicles for alternate selective pulling effort of the leading vehicle upon the following vehicle and pushing effort of the following vehicle upon the leading vehicle. For pushing effort, a pair of registering bumper assemblies are mounted respectively on the rear portion of the leading vehicle and the forward portion of the following vehicle, sized and positioned for mutual registration when the two vehicles are substantially misaligned. For pulling effort, a hook member is mounted on one vehicle, and a U-shaped drawbar is mounted on the second vehicle; the drawbar is adapted to be selectively lowered into engagement with the hook member and disconnected therefrom when the two vehicles are substantially misaligned and in motion.

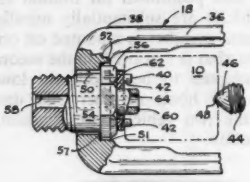
3,606,389
CONNECTOR FOR USE WITH REFRIGERATED CONTAINERS
Rupert Munton, Surrey, Hal Capper, London, and Kenneth White Pearson, Somerset, England, assignors to Shipowners Refrigerated Cargo Research Association, London, England
Filed Oct. 13, 1969, Ser. No. 865,547
Int. Cl. F16l 25/00
U.S. Cl. 285—9R 6 Claims



A coupling device for connecting transportable refrigerated containers to a supply of fluid under pressure and in particular for connecting such containers with a refrigeration system, the coupling comprising a mounting bracket for connection with a supply of fluid under pressure, a flexible extendible annular body which is impervious and thermally insulating connected at one end to the mounting bracket and at its other end to a support ring, said support ring having in its opposite surface an

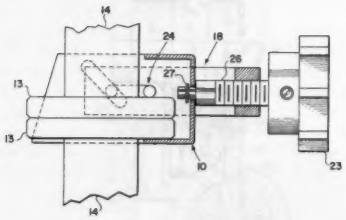
annular groove in which a plurality of resiliently deformable strands of material are mounted, the strands being arranged to abut against a sealing plate surrounding an aperture in the container and the bracket being connected to the duct leading to the supply of fluid, the annular ring being biased towards the container and the arrangement being such that the coupling is fully automatic and is provided with cam means which engage the container as the container is moved into the coupling station, the arrangement being such that when the container is in the coupling station it is connected to the supply of fluid and the coupling permits limited movements of the container in every direction yet still maintains a seal.

3,606,390
SWIVEL YOKE
Arthur R. Taylor, Alameda, Calif., assignor to Chemetron Corporation, Chicago, Ill.
Filed Apr. 1, 1969, Ser. No. 812,183
Int. Cl. F16l *35/00*
U.S. Cl. 285—39 **1 Claim**



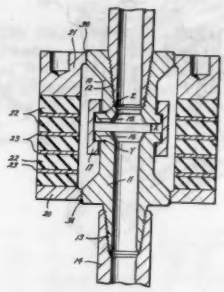
A yoke for connecting to a valve body, the yoke having a tubular stem rotatably and slidably received in a through bore having an axis generally parallel to the plane of the yoke and fastening means to secure a head on the stem between a circumferential shelf surrounding the bore and the valve body.

3,606,391
QUICK DISCONNECT CONDUIT CLAMP
John E. Sinnott, Richmond, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed June 24, 1970, Ser. No. 49,390
Int. Cl. F16l *23/00*
U.S. Cl. 285—38 **7 Claims**



A first clamp member has a bearing surface for engaging a clamping surface of one flange of a pair of mating flanges. The first clamp member also has two sides with each side having a slot therein that is positioned obliquely to the bearing surface. A second clamp member includes a pair of pins. Each pin passes through a corresponding slot. A screw drive is used to separate the two clamp members and in so doing causes the pins to slide down along the slots, clamping the pair of mating flanges between the pins and the bearing surface.

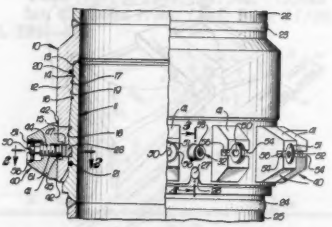
3,606,392
VIBRATION DAMPENER
William R. Garrett, Midland, Tex., assignor to Smith Industries International, Inc., Midland, Tex.
Filed Apr. 14, 1969, Ser. No. 815,854
Int. Cl. F16l *11/12*
U.S. Cl. 285—49 **7 Claims**



A vibration dampener may be used between the drill steel and power swivel of a boring machine. An annular stack of alternating rubber and metal rings bonded together and vulcanized, and including offset portions, provide means to transmit fluid, torque, and compression.

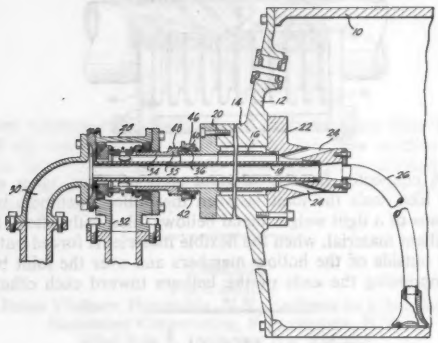
A pair of tubes with a lost motion connection therebetween disposed inside the annular stack provides means to transmit tension.

3,606,393
PIPE CONNECTORS
Carl F. Huntsinger, Ojai, and Fritz R. Huntsinger, Jr., Joseph H. Hynes, and George B. Bulgin, Ventura, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Sept. 5, 1969, Ser. No. 855,535
Int. Cl. F16l *15/00*
U.S. Cl. 285—90 **11 Claims**



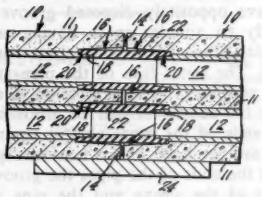
A marine riser connector for underwater well head equipment, the riser connector having a pin member provided with a groove for receiving a resilient lock ring carried by a box member. The lock ring has overlapped ends and is centralized in a groove in the box by spring-loaded centralizer pins. The lock ring is actuatable into locking engagement within the groove in the pin by actuator screws having lock ring engaging pads; and lock plates are provided to prevent rotation of the actuator screws except when they are engaged by a driving tool.

3,606,394
QUICK DISCONNECT JOINT
Richard Maurer, Three Rivers, Jack A. Hughey, Moore Park, and Ralph W. Gotschall, Wilfred L. McEnroe, and John E. Bonebright, Three Rivers, Mich., assignors to The Johnson Corporation, Three Rivers, Mich.
Filed June 12, 1969, Ser. No. 832,786
Int. Cl. F16l 39/04
U.S. Cl. 285—134 1 Claim



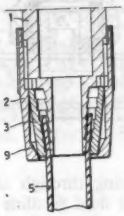
Adaptor structure for rotary pressure joint for communicating a rotating cylinder of a paper dryer, or the like, with a fluid source, the joint having a nipple driven by the dryer, there being means for connecting and disconnecting the driven nipple without interruption of the rotation of the dryer to effect joint repair and replacement.

3,606,395
METHOD AND APPARATUS USING PREFORMED CONDUITS
Phillip Salerno, Brooklyn, and Michael Sammaritano, Bayshore, N.Y., assignor of a fractional part interest to Angelo Raffa
Continuation-in-part of application Ser. No. 808,452, Mar. 19, 1969. This application Aug. 4, 1969, Ser. No. 847,342
Int. Cl. F16l 39/00
U.S. Cl. 285—137R 5 Claims



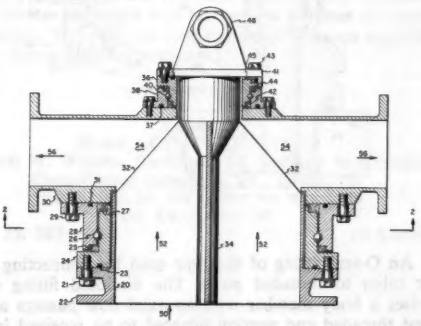
A method and apparatus used in laying underground cables, electrical wires and the like consists of preforming conduit sections having a plurality of spaced ducts for the electrical cables, wires and the like. The preformed conduit sections are placed in a trench below the normal level of the ground and their longitudinal ends are joined to one another to form continuous ducts within the conduit sections. The preformed conduit sections are sealed by a sealing compound between the longitudinal ends of two conduit sections to be joined.

3,606,396
UNIVERSAL PIPE GRIPPING UNION
Giordano Prosdocimo, Via Montereale 9, and Giacomo Brusadin, Via De Paoli 25, both of Pordenone, Italy
Filed Oct. 20, 1969, Ser. No. 867,685
Claims priority, application Italy, Oct. 23, 1968, 60,251-A/68
Int. Cl. F16l 33/00
U.S. Cl. 285—177 3 Claims



Pipe gripping union adapted to be coupled to tubes of various diameter and thickness by a conical indented rubber carrying spigot and a mating elastic tube locking ring.

3,606,397
FLUID SWIVEL WITH LOAD BEARING SHAFT
John F. Flory, Morristown, N.J., assignor to Esso Research and Engineering Company
Filed Sept. 9, 1969, Ser. No. 856,259
Int. Cl. F16l 27/08
U.S. Cl. 285—190 10 Claims

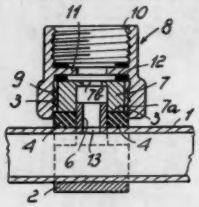


A submersible fluid swivel joint capable of carrying substantial axial and bending loads, capable of conducting fluid, and adapted to be installed along the longitudinal axis of a load bearing fluid conduit is provided and comprises a swivel member rotatable with respect to a stationary sleeve and shaft, said swivel member being disposed circumferentially with respect to said shaft, and having an outlet port in fluid communication with said sleeve, said shaft being capable of supporting substantial axial and bending loads and being reinforced by radial webs disposed within said sleeve, the supporting webs integrally connecting said sleeve and said shaft.

3,606,398
PIPE UNION DEVICE OF RAPID APPLICATION FOR FLUID FEEDLINE OFFTAKES
Franco Bocceda, Via Stefini 8, Milan 20125, Italy
Filed May 19, 1969, Ser. No. 826,305
Int. Cl. F16l 41/04
U.S. Cl. 285—197 3 Claims

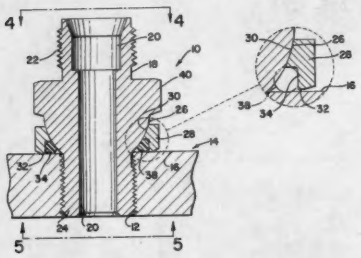
A pipe union device of rapid application for deriving offtakes from fluid feedlines which includes a forked mem-

ber for circumscribing a fluid feedline at a bore provided therein, a resilient member inserted between the arms of said forked member and arranged around said bore, a



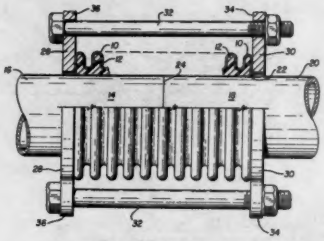
tubular member passing through said resilient member and extending to said fluid feedline and screwing means for clamping said forked member to said fluid feedline and urging said tubular member against said fluid feedline.

3,606,399
O-SEAL FITTING
Emery J. Zahuranec, Solon, Ohio, assignor to Crawford Fitting Company, Solon, Ohio
Filed Apr. 30, 1970, Ser. No. 33,222
Int. Cl. F16l *15/00*
U.S. Cl. 285—220 **9 Claims**



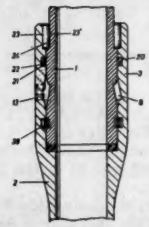
An O-seal fitting of the type used for connecting pipe or tubes to threaded ports. The disclosed fitting comprises a body member with an axial flow passage and a first threaded end portion adapted to be received in the threaded port. The opposite end portion is preferably arranged for connection to a pipe or tube through a standard coupling or the like. Seal means are positioned about the body to provide a fluid tight seal between the body and the outer end of the threaded port. The seal means shown in the drawings include a surface formed on the body member intermediate the ends and surrounding the first threaded end portion. An annular, relatively rigid ring member having an axial opening substantially larger than the diameter of the threaded end is positioned on the body and in engagement with the body surface. The ring member and the body surface are arranged so they can shift relative to one another. Preferably, the ring member has a concave spherical surface and the body surface is a convex spherical surface for engaging the body. On the side of the ring member opposite the spherical surface there is a recess which extends about the body and receives an O-ring seal that engages the body, the ring, and the surface surrounding the port. Because of the arrangement of the body portion and the ring, the ring can shift to assure proper mating and sealing of the O-ring with the area surrounding the threaded port even when the area is not perpendicular to the axis of the port.

3,606,400
PIPE CONNECTOR
Vernon C. Hines, 1400 South Lipan St., Denver, Colo. 80223
Filed Nov. 12, 1969, Ser. No. 875,766
Int. Cl. F16l *21/00*
U.S. Cl. 285—235 **10 Claims**



A connector for the adjacent ends of pipes, tubes or the like, seals the joint between the hollow members by means of a light weight metal bellows filled with a flexible resilient material, when the flexible material is forced onto the outside of the hollow members and over the joint by compressing the ends of the bellows toward each other.

3,606,401
CONNECTING SLEEVE
Walter Schwarz, Vienna, Austria, assignor to Integral Industriebedarf-Gesellschaft m.b.H., Vienna, Austria
Filed July 22, 1969, Ser. No. 843,365
Claims priority, application Austria, July 22, 1968, A 7,081/68
Int. Cl. F16l *13/00*
U.S. Cl. 285—294 **26 Claims**

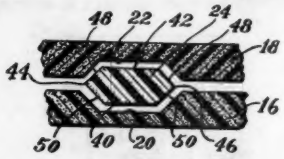


A connecting sleeve, particularly for glass fiber reinforced pipes of synthetic material, which comprises pipes to be connected having an outer face, and a sleeve defining an inner wall. The outer face of the pipe and the inner wall have oppositely disposed grooves, the latter defining jointly an annular space having an outwardly leading bore for filling the annular space with a hardening cast mass. The outer face of the pipe and the inner wall have an additional pair of grooves. A resilient ring is received in the additional pair of grooves. Means for securing the ends of the pipes against rotary and axial displacement are arranged and a tension cage surrounds the sleeve. At the ends of the pipes the grooves cross the engaging face of the sleeve and the pipe with conical faces along a common line.

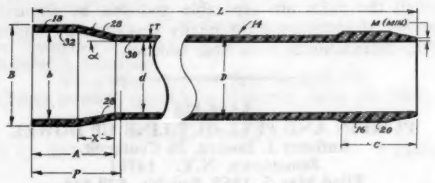
3,606,402
LOCKING MEANS FOR ADJACENT PIPE SECTIONS
Jonas Medney, Oceanside, N.Y., assignor to Fiberglass Resources Corporation, Farmingdale, N.Y.
Filed July 2, 1969, Ser. No. 838,390
Int. Cl. F16l *37/00*
U.S. Cl. 285—305 **15 Claims**

A key adapted to be inserted into a channel defined by opposed grooves in telescoped pipe sections provides

means for releasably locking the pipe sections to each other. The key is, in cross section, an hexagonal polygon having two surfaces that are radially spaced apart and parallel to the longitudinal axis of the pipe. The dimension between the radially spaced surfaces is less than that of the axially spaced vertices of the key. The vertices of the key are defined by side walls that are positioned at an angle not greater than 45° with respect to the longitudinal axis of the pipe.

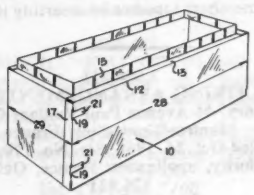


3,606,403
PIPE JOINT
Jonas Medney, Oceanside, N.Y., assignor to Fiberglass Resources Corporation, Farmingdale, N.Y.
Filed July 2, 1969, Ser. No. 838,402
Int. Cl. F16l *25/00*
U.S. Cl. 285—334.4 **6 Claims**



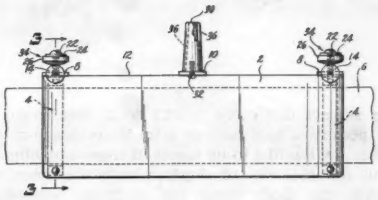
In a filament wound, resin reinforced pipe an improved joint is provided by means of an internal or female taper at one of each lengths and a plurality of contiguous external or male tapers at the opposite end thereof. Preferably the male tapers are three in number with the innermost one being at a greater angle than the female taper, the middle male taper being at less of an angle than the female taper and the outermost male taper being at substantially the same angle as the female taper.

3,606,404
DUCT-TO-REGISTER CONNECTOR
John L. McGann, Jr., Affton, Mo., assignor to Intertherm, Inc., St. Louis, Mo.
Filed Dec. 18, 1968, Ser. No. 784,814
Int. Cl. F16l *25/00*
U.S. Cl. 285—424 **2 Claims**



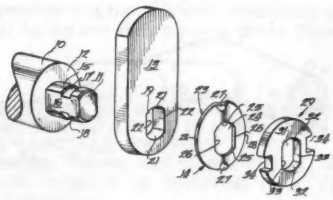
Openings in air ducts, beneath floor and wall surfaces, are cut by a routing process; and connected to rectangular surface register apertures by a readily installed duct connector section. Using the surface for alignment and its aperture edge for guiding a circular bearing guide, a routing tool projects through the aperture to cut a registering, smaller rectangular duct opening. Onto the margin around the duct opening is installed the inward end of a duct connector section, whose projecting tabs are manually bent into the opening for securement.

3,606,405
FISHLINE TYING DEVICE
Robert E. Lally, 10153 Camwood Drive, El Paso, Tex. 79925
Filed Oct. 29, 1969, Ser. No. 872,115
Int. Cl. D03j *3/00*
U.S. Cl. 289—17 **5 Claims**



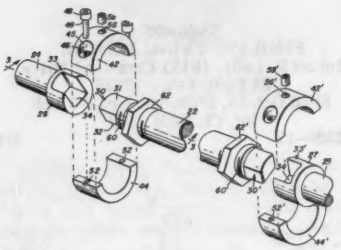
A curved sheet metal base having belt loops and outwardly bent ears respectively supporting spaced resilient line grippers and a central post. The post tapers upwardly and the ear on which it is mounted is notched on opposite edges. The post has longitudinal grooves on opposite sides, facing said line grippers.

3,606,406
SNAP ACTION RETAINER
Russell W. Walters, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Nov. 26, 1969, Ser. No. 880,222
Int. Cl. F16b *9/00*
U.S. Cl. 287—20 **10 Claims**



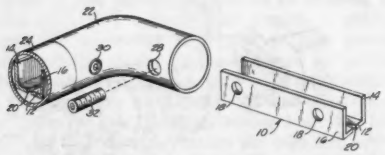
A snap action retaining structure for releasably securing a member onto a post or stud formed on a support where the post is generally cylindrical beyond a support shoulder with a pair of opposed flattened sides and an undercut channel or groove. The member to be retained has an opening conformably receiving the modified post circumference as does a stationary retainer spring having opposed detents on the periphery thereof. A retainer has a central opening conformably receiving the post and opposed peripheral notches initially 90° removed from the detents on the spring. Rotation of the retainer relative to the member and spring through an arc of 90° within the groove causes the notches to receive the detents on the spring to resiliently hold the retainer in retaining position.

3,606,407
BREAK-AWAY SHAFT
Lawrence Pendergast, 3403 Division St., St. Cloud, Minn. 56301
Filed Apr. 7, 1970, Ser. No. 26,236
Int. Cl. F16d 1/06
U.S. Cl. 287—52.01 4 Claims



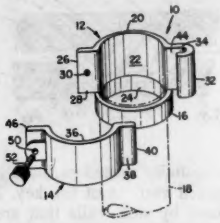
The subject disclosure relates to a break-away shaft which permits a tool such as a brush, grinding or polishing wheel or the like to be removed from a machine shaft without the necessity of disassembling the machine and removing the shaft from the machine bearings. The break-away shaft comprises a center shaft having shaped ends which are inserted into two shaft stubs having corresponding shaped recesses so that a torque transferring joint is formed. The shaft stubs are separately mounted in spaced machine bearings, with one of the shaft stubs extending through its bearing mounting for engagement by a driving means. A removable securing collar encircles each joint to hold the joint in position and the center shaft portion in alignment with the stubs. A holding member is carried on each end of the center shaft to secure a tool mounted on the center shaft.

3,606,408
COUPLING DEVICE FOR TUBULAR MEMBERS
Adolph A. Wagner, 3454 N. Shepard Ave., Milwaukee, Wis. 53211
Filed Apr. 1, 1969, Ser. No. 812,048
Int. Cl. E04g 7/00
U.S. Cl. 287—54 1 Claim



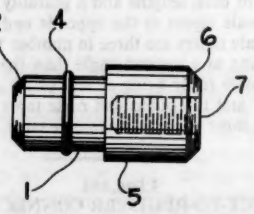
A connector for coupling a pair of tubular members in end-to-end relationship comprising a connector member of elongated channel shape having a base portion and a pair of leg portions adapted for insertion into the open ends of the tubular members. A plurality of set screws are threaded through threaded openings in one leg of the connector member for tightening into engagement with the inside face of the other member to thereby cause the leg portions to be expanded into tight gripping engagement with the inside surface of the tubular members. Access to the set screws is provided by openings in the walls of the tubular members. The base portion of the connector member is provided with a longitudinally extending slot to thereby weaken the base portion to facilitate expansion of the leg portions.

3,606,409
CLAMPING DEVICE
Norman L. Hawkins, Jr., Lafayette, Calif., assignor to Hawkins-Hawkins Co., Inc., Berkeley, Calif.
Filed Sept. 30, 1969, Ser. No. 862,205
Int. Cl. F16b 2/10, 7/10; F16m 11/00
U.S. Cl. 287—58CT 5 Claims



A device for releasably securing a first, elongated inner member to a second tubular member when the inner member is telescoped within the tubular member. The device includes a first part rigidly coupled to one end of the tubular member and a second part which mates with the first part and is releasably coupled thereto to clamp the inner member against the first member to thereby hold the members against movement relative to each other. The first part has a hook-shaped extension which receives a lateral extension on the second part, whereby the extensions form a pivot for rotating the parts relative to each other through a limited arc even though the parts are separable and can be connected together at locations substantially diametrically opposed to the extensions by a suitable fastener.

3,606,410
PUSH IN AND PULL OUT LINE UP DOWEL
Anthony J. Inserra, 26 Center St., Jamestown, N.Y. 14701
Filed May 5, 1969, Ser. No. 829,841
Int. Cl. F16b 13/00
U.S. Cl. 287—127 1 Claim

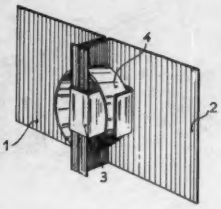


A dowel made up of two cylindrical parts integrally connected together, one being of greater diameter than the other, and in the smaller cylindrical part a circular O-ring is disposed in a groove, and an axially threaded hole is formed in the large end. The dowel is suitable for attaching two members together by inserting it in a threaded hole.

3,606,411
FIXING ARRANGEMENTS
Yves Didry, 44 Avenue Paul Vaillant Couturier, Montreuil-sous-Bois, France
Filed Oct. 24, 1968, Ser. No. 770,175
Claims priority, application France, Oct. 26, 1967, 126,021
Int. Cl. F16b 5/06
U.S. Cl. 287—189.36 6 Claims

Two or more cooperating bent edges of a plurality of sheet metal or the like members are releasably assembled through the use of a single or multi-channeled stirrup

member which straddles the bent edge portions of the sheet members to be joined. A resilient flexible clip is positioned against one side wall of the stirrup device within one of the channels so as to biasingly engage the bent edge portion of an associated sheet member thereby forcing it into abutting assembled relationship with a cooperating bent edge portion of a similar sheet member which may be



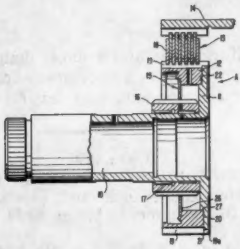
arranged in common or perpendicular plane. The stirrup device may have one or more channel members dependent upon the shape and position of the sheet members relative to one another and upon the number of clips necessary to provide a biasing force on the bent edge portions of the sheet members so as to maintain them in assembled abutting relationship.

3,606,412

FORM-LOCKING CONNECTION OF TORQUE TRANSMITTING STRUCTURAL PARTS, ESPECIALLY IN AUTOMATIC MOTOR VEHICLE TRANSMISSIONS

Josef Helmer, Aich, Kreis Nurtingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed May 16, 1969, Ser. No. 825,272
Claims priority, application Germany, May 16, 1968, P 17 50 586.1
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 **7 Claims**



A form-locking connection between a first structural part provided with external teeth and a second structural part; the external teeth of the first structural part are extended beyond its end face, and the second structural part is provided with external teeth engaging into the overhanging portion of the external teeth of the first structural part.

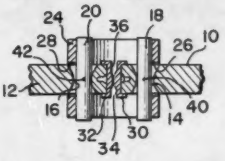
3,606,413

MECHANICAL COUPLING

Dieter Hedermann, Immenstaad am Kippenhorn, Germany, assignor to Dornier G.m.b.H., Friedrichshafen/Bodense, Germany

Filed June 11, 1969, Ser. No. 832,225
Claims priority, application Germany, Aug. 10, 1968, P 17 75 466.4
Int. Cl. F16b *7/00*
U.S. Cl. 287—94 **2 Claims**

A pair of movable members have holes in the adjacent ends thereof, and a substantially cylindrical connecting member is disposed within each of these holes and extends on opposite sides of the associated movable member. An annular spring has passages therein receiving the movable members and is disposed around said connecting members with the inner periphery of the spring



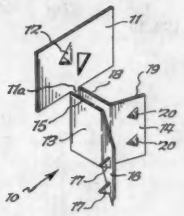
in engagement with the connecting members. End caps are mounted on the ends of each of the movable members and have arcuate inter-engaging surfaces thereon permitting angular movement of the movable members with respect to one another.

3,606,414

FASTENER

Thomas J. Haley, Griffin, Ga., assignor to Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,352
Int. Cl. F16b
U.S. Cl. 287—189.35 **10 Claims**



A fastener for securing to a first member, for example a stud, at one surface thereof a second and, if desired, also a third member, for example drywall panels, at the edge thereof. A uniplanar base member is mounted to the stud by cut-out anchor points driven therein. A leg member extending from the base overlays the edge of the panel when it is positioned against the stud, which leg is secured to the panel by cut-out anchor points driven therein.

3,606,415

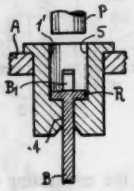
CONNECTING DEVICE FOR FASTENING TOGETHER TWO THIN PLATES IN RELATIVE ANGULAR POSITION

Gerard Friedling, Vernier, and Marcel Chuard, Meyrin, Switzerland, assignors to Technicair S.A., Vernier-Geneve, Switzerland

Filed Apr. 7, 1969, Ser. No. 813,958
Claims priority, application Switzerland, Apr. 5, 1968, 5,134/68
Int. Cl. F16b *17/00*
U.S. Cl. 287—189.35 **7 Claims**

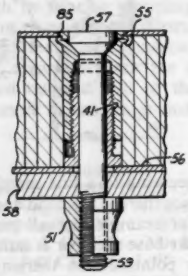
A mechanical device for connection of two thin plates in relative angular position, preferably of aluminum sheets, comprising a member adapted to be inserted into an opening of one of the plates, and including an enlarged head portion at one end forming an abutment shoulder, adapted to limit the insertion of the member into the opening and to abut the one of the plates adjacent the opening. The member has a slot starting from the insertable end of the member and extending substantially longitudinally in the member and passing crosswise through the member and adapted to receive the

other of the plates and oriented in an angular position relative to that of the one of the plates. The head portion has a recess accessible from the one end thereof and extends longitudinally therefrom overlapping the slot and at least partially extending therein and terminating in a



recess end spaced from the insertable end. The recess is adapted to receive a tool and is adapted to receive a flange formation formed on the other of the plates and to project beyond the slot, in order to attach the other of the plates to the member.

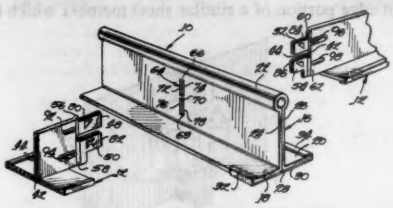
3,606,416
HONEYCOMB FASTENER
Edwin E. Hatter and William D. Tarrant, Fountain Valley, Calif., assignors to Hi-Shear Corporation, Torrance, Calif.
Filed Feb. 11, 1970, Ser. No. 10,474
Int. Cl. F16f 7/00
U.S. Cl. 287—189.36 **9 Claims**



A fastener for attaching a structure to a honeycomb body comprising a sleeve and a spacer that are threadedly attached to each other. The sleeve bears means for attachment to one of the skin sheets of the honeycomb body, and the spacer has an abutment surface adapted to be threaded down into contact with the other of said skin sheets so as to clamp said other sheet between itself and a workpiece which is to be attached to the body. The fastener transfers both shear and tensile loads to the honeycomb body, and the threaded joinder of the sleeve and spacer makes the grip range delicately adjustable, and protects the honeycomb body from crushing while the fastener is being set.

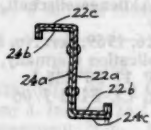
3,606,417
CEILING SUSPENSION
Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio
Filed Mar. 26, 1970, Ser. No. 22,810
Int. Cl. F16b 7/00
U.S. Cl. 287—189.36 **6 Claims**

A ceiling suspension system for supporting ceiling tiles including a longitudinal frame member having an upstanding web and laterally extending tile supporting flanges, and transverse frame members having pairs of tongues at opposite ends thereof, the tongues of each pair being oppositely offset and being adapted to extend through slot means in the vertical web of the longitudinal



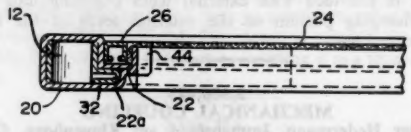
frame member, the tongues having oppositely projecting elements thereon engageable behind opposite edges of the slot means for retaining the transverse frame member with respect to the longitudinal frame member.

3,606,418
STRUCTURAL MEMBER
Paul S. Buker, Richard D. Shepard, and David P. Wenaas, Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
Filed Mar. 10, 1969, Ser. No. 805,666
Int. Cl. F16b 7/00
U.S. Cl. 287—189.36R **1 Claim**



A single uniform structural member that may be lapped on a like member to form a structurally continuous member capable of carrying axial and flexural stresses.

3,606,419
MOLDED PLASTIC CORNER LOCK
Perry L. Virkler, Chatsworth, and Thomas A. Vaughn, Piper City, Ill., assignors to Homeshield Industries Inc., Chatsworth, Ill.
Filed June 18, 1969, Ser. No. 834,474
Int. Cl. F16b 7/00
U.S. Cl. 287—189.36H **1 Claim**

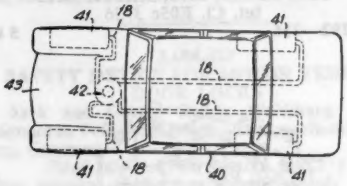


A corner lock for screen frames having right angularly disposed legs telescoped into the ends of perpendicular tubular screen frame members. The apex of the corner lock includes a projecting spacer extending diagonally on the top and bottom surface and extending vertically on the inner and outer surfaces of the apex to engage the adjacent ends of the screen frame members.

ERRATUM

For Class 289—17 see:
Patent No. 3,606,405

3,606,420
FLUID TRACK SANDING APPARATUS
Carl Lennart Hultstrom, Vallingby, Bolik Anders Eriksson, Johanneshov, and Elvin Efraim Arksten, Vallingby, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Feb. 17, 1970, Ser. No. 12,060
Int. Cl. B60b *39/08*; B61c *15/10*; F04d *25/06*
U.S. Cl. 291—3 11 Claims

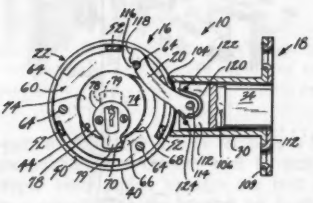


This invention relates to apparatus for sanding the regions of a road or passage adjacent to the wheels of a vehicle to prevent skidding. Sand is conducted by gravity from a downwardly directed spout of a hopper to the air inlet of the casing of a centrifugal blower having a motor driven bladed rotatable member therein. A plurality of air outlets are distributed about the periphery of the casing. The sand is substantially uniformly divided between the air outlets and propelled by air under pressure through hose connections to the regions of the road or passage adjacent to the wheels of the vehicle, a separate hose connection being provided from each air outlet to a different one of the regions of the road or passage. In order to prevent sand moving by gravity from the hopper into the air inlet of the casing and filling the latter with sand before the motor is energized to drive the bladed rotatable member, a single valve structure is provided at the spout of the hopper. The valve structure is closed, when the rotatable member is stationary and is opened when the rotatable member is running.

3,606,421
ANTIPILFERING DEVICE FOR A GLASS WINDOWED AUTOMOBILE DOOR
Arthur D. Reichenbach, 900 SW. 12th St., Fort Lauderdale, Fla. 33315
Filed May 18, 1970, Ser. No. 38,037
Int. Cl. E05c *21/00*; G05g *5/00*
U.S. Cl. 292—1 5 Claims

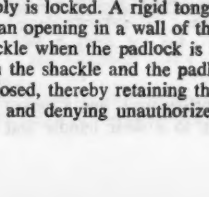
An antipilfering device for automobiles which, when in place, prevents the unlocking of the door from the outside except by use of the key, the device preventing the raising of the lock button by making access to it impossible, until the window glass is lowered far enough to free the device for removal.

3,606,422
LOCK ASSEMBLY
Thomas F. Hennessy, Bristol, Conn., assignor to Embart Corporation, Bloomfield, Conn.
Filed Sept. 4, 1968, Ser. No. 757,311
Int. Cl. E05b *9/08, 65/06*; E05c *1/06*
U.S. Cl. 292—139 25 Claims



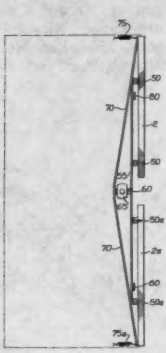
A reversible cylindrical lock assembly having an operating unit including a cylindrical casing containing a rotary operating ring, a bolt unit having a housing supporting a movable deadbolt, and an operating link providing motion transmission connection between the ring and the bolt. Manually operable inner and outer operating assemblies mounted on the casing impart rotational movement to the ring to move the bolt to projected and retracted positions. Fasteners releasably secure the bolt unit to the operating unit and also secure the operating assemblies to the latter unit. These fasteners are inaccessible when the bolt is projected and in engagement with an associated strike.

3,606,423
LOCK PROTECTING ASSEMBLY
William P. McCarthy, Kansas City, Mo., assignor to Ridgewood Instrument Company, Kansas City, Mo.
Filed Dec. 19, 1969, Ser. No. 886,682
Int. Cl. E05b *67/38*; E05c *1/04*
U.S. Cl. 292—148 3 Claims



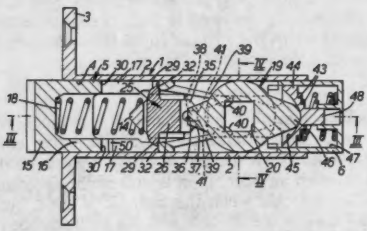
A locking assembly incorporating a padlock wherein the latter is housed within a rigid, protective enclosure when the assembly is locked. A rigid tongue is configured to pass through an opening in a wall of the enclosure and the padlock shackle when the padlock is open, but to be retained between the shackle and the padlock body when the padlock is closed, thereby retaining the padlock within the enclosure and denying unauthorized access to the shackle.

3,606,424
DOOR LOCKING DEVICE
Roger Lucas, 106 Cours Albert-Thomas, Lyon 8e, Rhone, France
Filed Nov. 13, 1969, Ser. No. 876,232
Claims priority, application France, Oct. 9, 1969, 6934884
Int. Cl. E05c *1/02*
U.S. Cl. 292—157 **5 Claims**



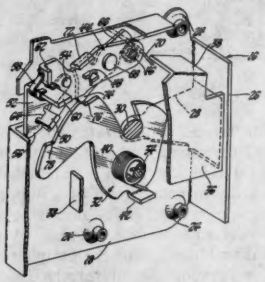
A door locking device in which an elongated vertically extending locking plate having a length substantially equal to the height of the door is mounted within a slot formed along one edge of the door to be movable from a locking position wherein the locking plate projects beyond the edge of the door and an unlocked position wherein the locking plate is withdrawn within the slot, behind the edge. The locking plate is connected to a vertically extending link rod by means of a set of short lugs connected, on the one hand, to the locking plate and connected, on the other hand, to the link rod. The said link rod is secured at the center to one end of a latch bolt operable to be displaced in a reciprocating horizontal motion. A vertically extending brace is centrally connected to the other end of the latch bolt and to the upper and lower ends of the locking plate. Return springs are provided at the top and bottom of the door, having one end fixed to the door and the other end fixed to one of the ends of the locking plate.

3,606,425
DOOR LATCHES
Michael Joseph James, Charlton Kings, Cheltenham, England, assignor to Micro & Precision Mouldings (Cheltenham) Limited, Cheltenham, England
Filed May 20, 1969, Ser. No. 826,185
Claims priority, application Great Britain, May 27, 1968, 25,325/68
The portion of the term of the patent subsequent to Mar. 3, 1987, has been disclaimed
Int. Cl. E05c *1/16*
U.S. Cl. 292—173 **5 Claims**



A tubular mortice latch has a rotary actuating member for coupling to a door handle and an intermediate follower member. Both members pivot within a housing about parallel axes, and the actuating member engages and turns the follower member which in turn engages a bolt to withdraw the latter into the housing. There is a peg and slot connection between the members, and the slotted member is moulded from a resilient material with the slot having a reduced mouth so that during assembly it snaps on to the peg.

3,606,426
CLOSURE LATCH
Wieslaw S. Zaydel, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 19, 1970, Ser. No. 3,813
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **5 Claims**

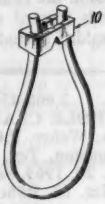


A vehicle body door lock includes a bolt pivotally mounted on a frame for movement between latched and unlatched positions and a detent carrier pivoted on the frame and carrying a pivoted locking member which is normally spring biased into engagement with a frame tab to lock the carrier against movement. A detent is pivoted to the carrier for unitary movement therewith and movement independently thereof. When the carrier is in locked position, a detent shoulder is normally located in the path of movement of a bolt shoulder to hold the bolt in latched position. A solenoid is operable to extend the armature thereof and engage the locking member to sequentially first release the locking member from engagement with the frame tab and then engage the locking member with the carrier to swing the carrier relative to the frame. The carrier moves the detent to a position wherein the shoulder thereof is out of the path of movement of the bolt shoulder to permit the bolt to move to unlatched position. When the solenoid is deenergized, a tension spring between the carrier and frame returns the carrier to its initial position and the locking member again engages the latch frame. The bolt shoulder ratchets past and into engagement with the detent shoulder when the bolt moves from unlatched to latched position. The detent moves independently of the carrier during such movement of the bolt, and the carrier remains locked to the frame.

3,606,427
POWDERED METAL FRANGIBLE SEAL
Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Apr. 27, 1970, Ser. No. 31,957
Int. Cl. B65d *33/34*
U.S. Cl. 292—307R **7 Claims**

A frangible seal is disclosed as including a powdered metal sleeve which includes a weakened area. The frangible seal is designed to firmly grip two or more members

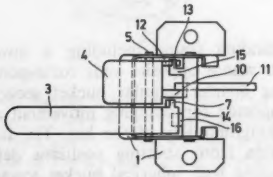
adjacent each other and upon the members being pulled away from each other fracture the sleeve along its weakened area to provide a visual indication of the members having been separated from each other.



3,606,428
SAFETY DEVICE FOR MOTOR VEHICLE DOOR LOCKS

Karl Erck and Gunter Rafelt, Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed July 9, 1969, Ser. No. 840,278
Claims priority, application Germany, July 9, 1968, P 17 03 776.2
Int. Cl. E05b *3/00;* **E05c** *1/04*
U.S. Cl. 292—336.3 **5 Claims**

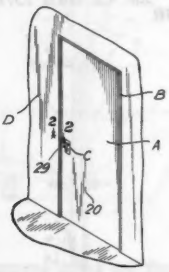


A safety device for the door locks of motor vehicles having an inside operating lever with a safety button mounted adjacent and together with the operating lever and with the operating rod and coupling means for the safety button with an intermediate shaft which extends behind the operating lever.

3,606,429
ANTITHEFT LOCK CONSTRUCTION

Charles E. Palmer, 10 Elizabeth St. S., Port Credit, Ontario, Canada

Filed June 16, 1969, Ser. No. 833,354
Int. Cl. E05b *15/02*
U.S. Cl. 292—340 **2 Claims**

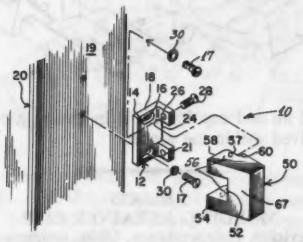


The present disclosure relates to a safety lock plate which is mounted on the door edge confronting the jamb and which is formed with a rectangular or other shaped opening, through which the bolt passes. Integral with the plate at its inner edge parallel to the jamb is a flange which is bent back toward the jamb.

3,606,430
SPLIT LOCK KEEPER

Ernest J. Parmel, Jr., Long Island City, N.Y., assignor to Traulsen & Co., Inc., College Point, N.Y.

Filed Dec. 10, 1969, Ser. No. 883,927
Int. Cl. E05b *15/02*
U.S. Cl. 292—341.18 **7 Claims**

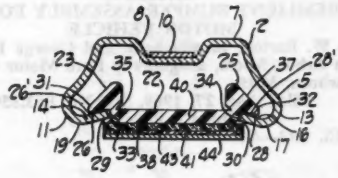


A two-part or split lock keeper includes a bracket or retainer mountable on a cabinet wall by screws. A U-shaped keeper body which engages the bolt of a lock on a door is attached to the bracket by further screws. Legs of the keeper body cover the screws holding the bracket. When the door is closed it covers and conceals screws holding the keeper body on the bracket.

3,606,431
VIBRATION ABSORBING MOLDING RETAINER CLIP

Alex Kunevicius, Independence, Ohio, assignor to Custom Trim Products, Inc., Cleveland, Ohio

Continuation-in-part of application Ser. No. 601,473, Dec. 13, 1966, now Patent No. 3,439,950, and a division of application Ser. No. 752,578, Aug. 14, 1968, which is a continuation-in-part of said application Ser. No. 601,473, which in turn is a continuation-in-part of application Ser. No. 477,273, Aug. 4, 1965. This application Feb. 24, 1970, Ser. No. 14,086
Int. Cl. B60j *11/00;* **B60r** *19/08;* **E04f** *19/02*
U.S. Cl. 293—1 **24 Claims**



A cushioning clip for retaining metal and other moldings on vehicles and other surfaces which is self adhering, resists dislodgment due to vibration, shock, and the like, and obviates the need to puncture or otherwise provide apertures in the surface for the fasteners or holders which retain the molding in place.

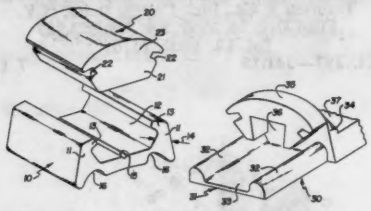
3,606,432
PROTECTOR STRIP

Robert W. Honatzis, 545 W. 10th Ave., Vancouver, British Columbia, Canada

Filed Dec. 2, 1968, Ser. No. 780,342
Int. Cl. B60r *13/04*
U.S. Cl. 293—1 **1 Claim**

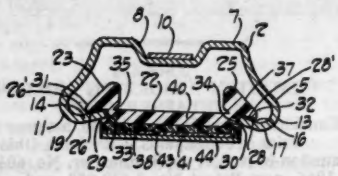
An automobile protector strip comprising an aluminum extrusion with an insert receiving groove on the side outer-

most from the vehicle contacting side adapted to form, with the panel of the vehicle to which it is secured, a



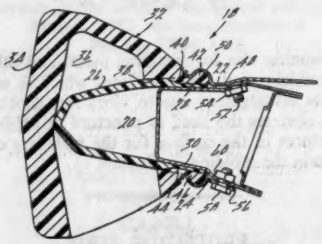
socket and an end cap for the strip having a plug shaped to be received within the socket.

3,606,433
MOLDING RETAINER CLIP
Alex Kunevicius, Independence, Ohio, assignor to Custom Trim Products, Inc., Cleveland, Ohio
Continuation-in-part of application Ser. No. 601,473, Dec. 13, 1966, now Patent No. 3,439,950, which is a continuation-in-part of application Ser. No. 477,273, Aug. 4, 1965, now abandoned. This application Aug. 14, 1968, Ser. No. 752,578
Int. Cl. B60j *11/00;* **B60r** *19/08;* **E04f** *19/02*
U.S. Cl. 293—1 **24 Claims**



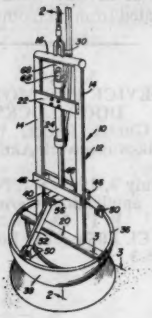
A clip for retaining metal and other moldings on vehicles and other surfaces which is self-adhering, resists dislodgment due to vibration, shock, and the like, and obviates the need to puncture or otherwise provide apertures in the surface for the fasteners or holders which retain the molding in place.

3,606,434
RESILIENT BUMPER ASSEMBLY FOR A MOTOR VEHICLE
David W. Barton, Birmingham, and George H. Muller, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 27, 1969, Ser. No. 853,350
Int. Cl. B60r *19/08*
U.S. Cl. 293—64 **9 Claims**



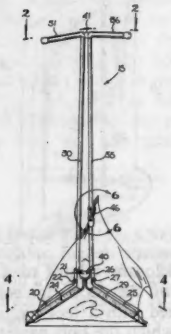
A resilient bumper assembly for a motor vehicle. This assembly includes a resiliently deformable bumper and at least one resiliently deformable bumper guard having a vertical dimension greater than the vertical dimension of the bumper. The bumper and bumper guard are secured to a vehicle structural member and to each other by one of a plurality of clamp arrangements. These clamps function without the necessity of fasteners extending through holes in the resilient members, but rather engage enlarged beads formed on the resilient members or the clamps are molded partially within these members.

3,606,435
BORE HOLE CLAM BUCKET
Alman A. Weber, P.O. Box 35564, Houston, Tex. 77035
Filed Oct. 20, 1969, Ser. No. 867,600
Int. Cl. B66c *3/00*
U.S. Cl. 294—70 **4 Claims**



An upstanding frame including a lower horizontal cross-bar to whose opposite ends corresponding portions of opposing quarter circular bucket sections are oscillatably supported for swinging movement about an axis extending longitudinally of the bar. The bucket sections are swingable from abutting positions defining an upwardly opening half spherical bucket toward open positions with remote portions thereof disposed on opposite sides of the axis of oscillation of the bucket sections swung upwardly whereby a jaw opening is formed between the lower opposing marginal portions of the bucket sections. An actuator is supported from the frame and operatively connected to the remote upwardly swingable portions of the bucket sections for swinging the latter between the open positions thereof and the closed abutting positions thereof.

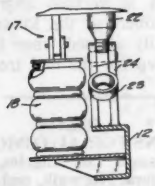
3,606,436
RECEPTACLE DEVICE
Robert D. Lynch, 3520 5th Ave., Los Angeles, Calif. 90018
Filed Mar. 10, 1970, Ser. No. 18,260
Int. Cl. A47f *13/08*
U.S. Cl. 294—19R **10 Claims**



Portable device for picking up small objects underfoot, having a pair of blade-like members secured in superin-

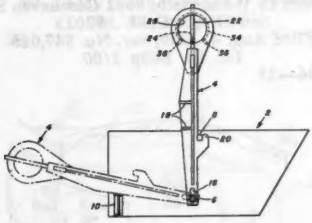
cumbent relationship to the lower ends of a pair of operating rods and arranged for pincers-like movement upon manipulation of the rods. A limp bag is invertedly mounted with its mouth secured to the blade-like members. The blade-like members are placed to straddle the object and the rods manipulated to bring the members together beneath the bag and to close the bag, crossing of the members then urging the object into a sagging portion of the bag.

3,606,437
TRUCK TRACTOR CAB SUSPENSION SYSTEM
William G. Pierce, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Aug. 21, 1969, Ser. No. 852,020
Int. Cl. B62d *23/00*
U.S. Cl. 296—35 3 Claims



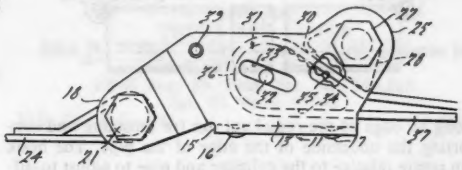
A suspension system for truck tractor cabs includes low rate cushion devices as front cab-to-chassis mounts and relatively rigid cab-to-chassis mounts placed near the pitch nodal axis of the tractor chassis, at the rear of the cab, thus substantially isolating the cab from the pitch of the tractor chassis.

3,606,438
SCRAP-BOX BAIL ADAPTED FOR ENGAGEMENT BY COIL LIFTER
Paul Feczko, Gary, Ind., assignor to United States Steel Corporation
Filed Nov. 18, 1968, Ser. No. 776,651
Int. Cl. B66c *3/00*
U.S. Cl. 294—73 2 Claims



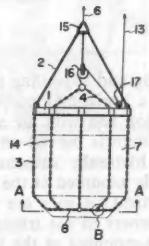
Disclosed is an improved lifting bail for containers such as industrial scrap boxes. The bail is constructed with a pair of parallel lifting eyes disposed normal to a conventional lifting eye in the spreader bar of the bail. The disclosed structure makes it possible for the bail to be manipulated by a conventional hoisting crane hook or by an auxiliary lifting means, such as a motorized coil lifter, attached to a conventional crane hook.

3,606,439
WEBBING GRIPPER
Louis W. Rutan, Clark Lake, Mich., assignor to Aeroquip Corporation, Jackson, Mich.
Filed Feb. 19, 1969, Ser. No. 800,618
Int. Cl. B66c *1/12*
U.S. Cl. 294—74 1 Claim



A device for adjusting the length of webbing legs in cargo slings. A U-shaped body has a wedge extending between the side walls, with pins guided by slots in these walls. A smooth surfact of this wedge faces the central body section and a serrated surface faces a similar serrated surface on a stationary pressure bar extending between the side walls. The webbing to be adjusted is wrapped around the rounded large end of the wedge and passes between the wedge and the pressure bar on one side, and the wedge and central body section on the other side. The slots are inclined, and tension on the webbing thus forces the wedge toward both the central body section and pressure bar to grip the webbing on both sides. A cross pin bridges the side walls adjacent the wide end of the wedge and prevents an excessive-sized loop from forming in the webbing should it be momentarily loosened.

3,606,440
SCRAP BLOCK INSERTION APPARATUS
Saburoji Ozeki, Tokyo, and Soichi Shimasaki and Osamu Kadota, Yokohama-shi, Kanagawa-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha
Filed May 26, 1969, Ser. No. 827,870
Int. Cl. B66c *1/12*
U.S. Cl. 294—76 7 Claims

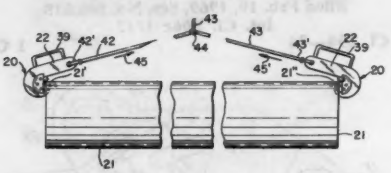


An improved recoverable apparatus for insertion of scrap blocks into a furnace, such as an electrical steel making furnace, wherein removable connecting pins are used to releasably secure the ends of the block holding chains together to retain the block. An auxiliary chain is coupled to the pins for removal of the pins to release the block in the furnace.

3,606,441
HOIST HOOK DEVICE
Leland M. Ridgely, 1711 Jacquelyn 21, Houston, Tex. 77055
Filed Nov. 12, 1969, Ser. No. 875,678
Int. Cl. B66c *1/34*
U.S. Cl. 294—78R 4 Claims

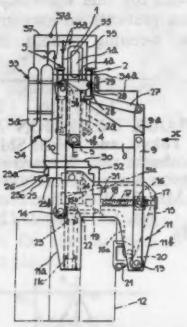
The invention comprises a J-shaped hoist hook. The hook has a cylinder mounted in the apex of the hook,

with the hook being rotatable relative to cylinder. The cylinder has a radial cut out to receive the outer edge of a cylindrical pipe, a curved plate is fixed to the cylinder



along an edge of the radial cut out for engaging and supporting the underside of the edge of the pipe. The hook can rotate relative to the cylinder and pipe to adjust to different angles when lifting the pipe.

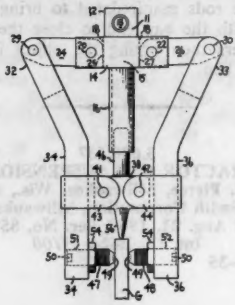
3,606,442
HANDLING AND SWIVELLING TONGS FOR REELS OF SHEET METAL
Ghislain Antoine Jean-Marie Martelee, Liege, Belgium, assignor to Cockerill-Ougree-Providence et Esperance-Longdoz en abrége "Cockerill," Seraing, Liege, Belgium
Filed June 20, 1969, Ser. No. 835,120
Claims priority, application Belgium, June 27, 1968, 717,285
Int. Cl. B66c *1/44*
U.S. Cl. 294—88 **13 Claims**



Tongs for handling and swivelling a coil of metal sheet from a vertical to a horizontal position and vice versa, comprise a suspension rod with an opening for a lifting hook. A sliding column is moved on and relative to the suspension rod by hydraulic suspension jacks, and two triangles are hingedly mounted at the base of the column near one apex. Vertical tie rods are pivotally connected to the other two corners of the triangles, and a gripping element is pivotally mounted at the lower end of the tie rods. The gripping element carries a locking jaw for locking the coil, and a compression spring acts on the locking jaw, while a hydraulic motor is provided for displacing the locking jaw against the action of this spring. A pivoting jack pivots the triangles and thus swivels the gripping element.

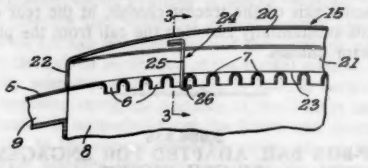
3,606,443
GLASS GRIPPING TONGS
Frank F. Painter, Tarentum, and Samuel L. Seymour, Oakmont, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 27, 1968, Ser. No. 787,337
Int. Cl. B66c *1/48*
U.S. Cl. 294—106 **5 Claims**

Tongs having a pair of lever arms pivoted to a lower tong member and extending beyond the lower tong member to carry glass engaging members, a pair of links pivoted between an upper tong member and one or the other tong arms and alignment means coupling said upper and lower tong members in such a manner to



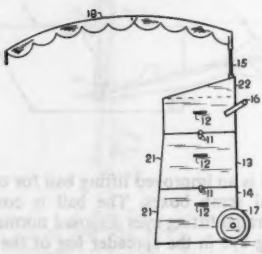
maintain the tongs in vertical alignment so that the glass engaging members at the lower end of the lever arms are horizontally aligned when the tongs engage a glass sheet suspended for thermal treatment.

3,606,444
AIR SCOOP MEANS FOR AUTOMOTIVE VEHICLES
Howard M. Allenbaugh, Los Angeles, Calif., assignor to Louis Martin Majera, Norwalk, and Charles R. Goebel, Glendale, Calif., fractional part interest to each
Filed Sept. 4, 1969, Ser. No. 855,098
Int. Cl. B60h *1/30*
U.S. Cl. 296—1S **1 Claim**



A snap-retention air scoop means operatively associated with either the ventilating system, or induction of air to service the engine of an automotive vehicle, or both.

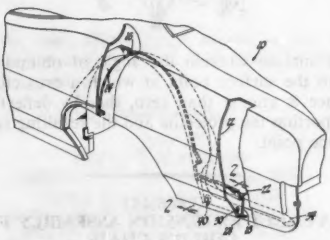
3,606,445
CAMPING CABINET
William C. Wunderlich, 8602 Glenhaven St., San Diego, Calif. 92023
Filed Aug. 4, 1969, Ser. No. 847,015
Int. Cl. B60p *3/00*
U.S. Cl. 296—23 **1 Claim**



A camping cabinet consisting of a plurality of vertically stacked sections each having a storage space therein with separate handles, each section being locked to an

adjacent section; the top section having a wide handle and the bottom section having a pair of wheels for portability; the top section having a pair of extending spring brackets for cooperation with a canopy frame; the canopy frame carrying a canopy extending over the cabinet; the bottom two sections having a front taper for gravity closing doors thereon.

3,606,446
DRAIN HOLE PLUG ASSEMBLY
James D. Leslie, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 27, 1969, Ser. No. 869,793
Int. Cl. B62d *39/00*
U.S. Cl. 296—28R 7 Claims

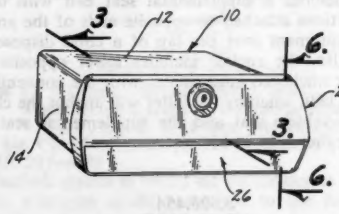


A plug assembly to seal a drain hole opening in a vehicle body panel, the plug assembly including a retainer plug having a plug body portion which is inserted into the drain hole of a panel and secured therein, the retainer plug supporting a flexible washer serving as a flap valve which is retained against the outer face of the panel by an annular flange of the retainer plug, with the flexible washer being protected from heat by an annular flange on the plug retainer which extends outwardly and is spaced from the flexible washer.

ERRATA

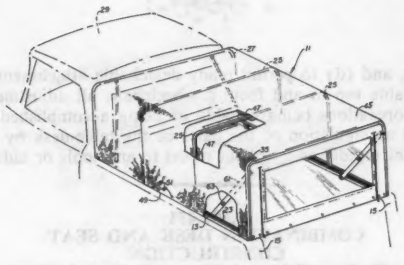
For Classes 296—37 and 339—14 see:
Patent Nos. 3,606,437 and 3,606,155

3,606,447
VEHICLE STEREO TAPE AND GLOVE COMPARTMENT
Ronald A. Ryding, Woodland Hills, Calif.
(2831 Topaz Drive, Apt. C, Riverside, Calif. 92507)
Filed June 30, 1969, Ser. No. 837,436
Int. Cl. B60r *7/00*
U.S. Cl. 296—37 4 Claims



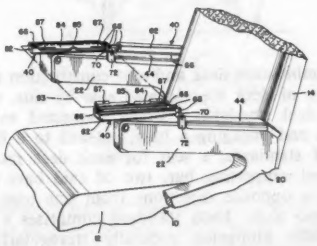
An enclosure for tape players and tape cartridges having a reversible mounting bracket permitting the compartment to be mounted under the dashboard of the vehicle or on the tunnel over the power drive shaft. The mounting bracket provides a theft proof installation. The interior of the compartment is provided with upstanding cartridge guide shoulders for maintaining the tape cartridges in a stored condition on opposite sides of the tape player. Appropriately shaped depressions are formed in the inner surface of the compartment door for holding refreshment containers or the like.

3,606,448
TRUCK BED COVER
John W. Walker, Arroyo Grande, Calif., assignor to Jack Vincent Feather
Filed Aug. 29, 1969, Ser. No. 854,168
Int. Cl. B62d *25/00*
U.S. Cl. 296—105 1 Claim



A collapsible pickup truck bed cover supported by U-shaped cover support bows having their lower ends slidably engaged to channel members secured to the rails of the truck bed.

3,606,449
TRAY HOLDER FOR SEATS
Clifford Wayne Whybrew, Saugus, and Ralph G. Marrujo, Valencia, Calif., assignors to Fairchild Hiller Corporation, Bay Shore, N.Y.
Filed Jan. 8, 1969, Ser. No. 789,875
Int. Cl. A47c *7/68*
U.S. Cl. 297—115 4 Claims

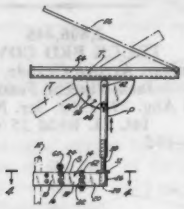


A tray-holding arrangement for use in conjunction with vehicle seats in which each of the arms of a seat is provided with a dual, or paired, armrest arrangement. The upper armrest of each pair is movable away from lower, stationary armrest and includes a storable shelf which can be folded outwardly for supporting and holding a tray.

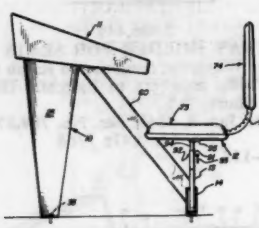
3,606,450
WHEELCHAIR TABLE-DESK
Earl K. Sedgwick, 42 Carlton Place, Rutherford, N.J. 07073
Filed July 7, 1969, Ser. No. 839,224
Int. Cl. A47b *37/02*
U.S. Cl. 297—149 10 Claims

A wheelchair table-desk comprising a table-desk top, spaced posts mounting said top and a support for the same, the support and mounting posts being constructed

and designed to enable a handicapped person to (a) adjustably move the table top horizontally to a substantial variety of positions, (b) to move the table top to vertically adjusted positions within a wide latitude, (c) to adjustably move the same to a number of inclined positions, and (d) to permit ready detachable attachment of the table top to and from a wheelchair, all adjustments and operations being capable of being accomplished by hand manipulation of the parts of the table-desk by the patient rapidly and without resort to any tools or aids.



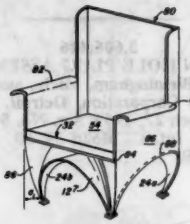
3,606,451
COMBINATION DESK AND SEAT CONSTRUCTION
James B. Brownfield and Edward E. Nation, Cheyenne, Wyo., assignors to Cannon Aeronautical Center, Cheyenne, Wyo.
Filed Mar. 19, 1969, Ser. No. 808,553
Int. Cl. A47c *39/00*
U.S. Cl. 297—174 15 Claims



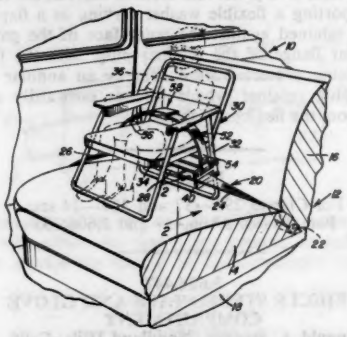
The combination desk and seat construction comprises a plurality of deck tops located side by side, supported by a vertical standard, a brace connected to adjacent desk tops and engaging a base fastened to a floor rearwardly of standards, a seat for each desk mounted on an inclined supporting bar, two of said bars extending sidewise in opposite directions from one base for supporting two seats. Each standard comprises a plurality of vertically elongated generally triangularly shaped panels connected together and providing an upper edge for supporting the major width of a desk top and a relatively small lower end bearing on the floor. Each seat comprises an integrally formed curved frame which has similar cushioned members mounted on opposite sides of one end to form a seat and has similar cushioned members mounted on opposite sides of the other end to form a backrest.

3,606,452
VEHICLE SEAT
William J. Riffe, Scott Township, Allegheny County, Pa., assignor to United States Steel Corporation
Filed Feb. 2, 1970, Ser. No. 7,652
Int. Cl. B60r *21/10*
U.S. Cl. 297—216 28 Claims

An armored seat for an armored vehicle such as a tank, jeep, airplane, helicopter or the like is disclosed. The armored vehicle has a floor and the seat has a base provided with a side-to-side barrel vault intersecting a front-to-back barrel vault to provide a plurality of resilient base legs mounted on the floor and for crash attenuation. A seat portion is secured to the base. The base provides a curved surface wherein the angle of obliquity with a normal to the surface point at which a projectile strikes the surface is greater than zero, thereby deflecting from the seat portion the projectile and the resulting spall from the seat surface point.



3,606,453
SEAT BELT EXTENSION ASSEMBLY FOR CHILD'S CHAIR
James J. Cicero, 321 N. 7th St., River Falls, Wis. 54022
Filed Oct. 29, 1968, Ser. No. 771,410
Int. Cl. A47d *1/10*
U.S. Cl. 297—254 9 Claims



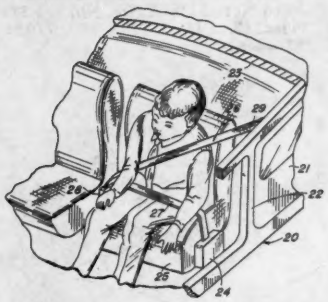
An elongated anchor for positioning beneath the seat portion of a child's seat supported from a vehicle seat above the cushion and forward of the backrest thereof. The anchor may or may not be secured to the child's seat, but includes a supplemental seat belt with opposite end portions attached to opposite ends of the anchor and for securement over the lap of a child disposed in the seat. Also, the anchor includes lower opposite end portions for anchored engagement with the conventional vehicle seat belt, whereby the latter will anchor the child's seat to the vehicle seat and the supplemental seat belt will anchor the child in his seat.

3,606,454
SEAT BELT
Harold G. Dorn, 4717 Manchester Drive, Middletown, Ohio 45042
Filed Aug. 21, 1969, Ser. No. 851,822
Int. Cl. B60r *21/10*
U.S. Cl. 297—385 13 Claims

A seat or safety belt device in which one of the usual pair of interconnecting belt segments is eliminated. The

single belt element used is adapted for insertion in a receptacle installed between a seat and backrest, which receptacle is uniquely adapted to accommodate adjustment of the seat. Manipulative means on the belt element utilized permits the locking and release of the belt using only one hand.

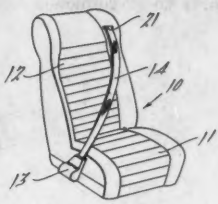
3,606,455
SAFETY HARNESS
Andrew G. Carter, 50 Market NW., Grand Rapids, Mich. 49502
Filed Apr. 29, 1969, Ser. No. 820,079
Int. Cl. A62b *35/00*; B60r *21/00*
U.S. Cl. 297—386 **3 Claims**

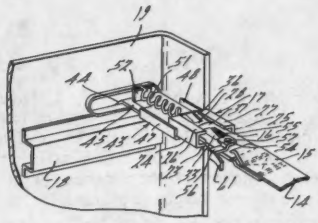


A safety harness formed by a buckle interposed on a continuous belt between a roof terminal at one side of a seat and a floor-mounted locking take-up on the same side, the buckle being engageable with a floor-mounted terminal on the opposite side of the seat. The buckle has releasable restraint against relative movement along the belt toward the take-up, providing resistance to a movement of the belt through the buckle which extends the section of belt between the buckle and the roof terminal.

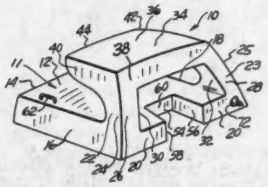
3,606,456
SEATBELT SYSTEM
Dennis C. Cazabon, Grosse Pointe, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Aug. 3, 1970, Ser. No. 60,488
Int. Cl. A44b *11/20*; A47d *17/00*; B60r *21/10*
U.S. Cl. 297—388 **9 Claims**

A seatbelt system in which the buckle device adapted to receive a tongue member secured to the free end of a seatbelt is mounted on a seat frame and is enclosed, except for an access aperture, by the heat upholstery trim. The buckle device is slidably mounted on a guide and is springloaded to be urged into a retracted position. The tongue member when coupled to the buckle device also becomes concealed. Upon a pull being exerted on the belt in a direction away from the seat trim, the coupled buckle device and tongue member are pulled through the aperture a sufficient distance to expose a latch release actuator mounted on the tongue member. This actuator is operable to disengage the latch plate of the buckle device from the tongue member to permit the latter to be uncoupled from the buckle means.





3,606,457
PASSENGER RESTRAINT DEVICE
Robert R. Reay, Grosse Pointe Woods, Mich., assignor to International Engineering Service, Inc., Birmingham, Mich.
Filed Sept. 5, 1969, Ser. No. 855,555
Int. Cl. B60r *21/10*
U.S. Cl. 297—390 **8 Claims**

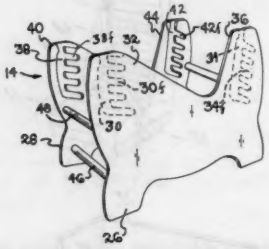


An inflatable passenger restraint device for restraining an occupant of a vehicle seat during sudden deceleration of the vehicle including a seat member for positioning beneath the passenger, a pair of side members extending upwardly from the seat member and a shield joining the upper ends of the side members and located in front of a portion of the upper torso of the seated passenger. A pair of loops are formed on the lateral edges of the seat member for threading a conventional vehicle lap belt therethrough, holding the device and the seated passenger in position.

3,606,458
LEG SUPPORTING STOOL
Alvin J. Attinger, 749 W. State Line Road, Toledo, Ohio 43612
Filed June 9, 1969, Ser. No. 831,339
Int. Cl. A47c *7/50*, *9/12*
U.S. Cl. 297—439 **5 Claims**

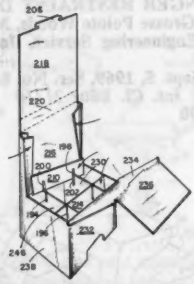
A stool for supporting the legs of a person sitting in a chair, having a pair of opposed footed side members

joined together by cross bars, there being a vertical groove and a series of downwardly inclined finger extensions from the groove on the forward and rearward portions of the inner face of each side member, a generally horizontal leg receiving cushion of L shape in longi-



tudinal cross section with the base of the L shape directed upwardly to provide a foot abutting surface, pins extending outwardly and laterally from the lower edges of the cushion near the ends thereof, said pins being adapted to enter selected fingers of the grooves for holding the cushion at the desired height and angle.

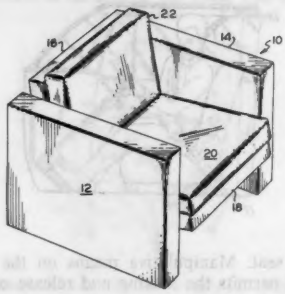
3,606,459
COLLAPSIBLE CHAIR OF IMPROVED STRENGTH
Martin Krone, 60 E. 42nd St., New York, N.Y. 10017
Filed Aug. 21, 1969, Ser. No. 851,884
Int. Cl. A47c 7/00
U.S. Cl. 297—440 **6 Claims**



A collapsible chair of improved strength, made of suitable stiff sheet material such as relatively stiff cardboard or corrugated paperboard, formed of a blank which has been adapted by means of a plurality of fold, cut and score lines in such a way that when the blank is folded along the fold lines a chair having a reinforced back will be defined thereby, the cut lines forming wing sections imparting additional reinforcement to the back, the score lines defining removable sections which, when removed, are effective to simultaneously form supports for the seat and act as a removable lock for the chair.

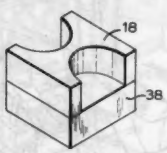
3,606,460
FURNITURE CONSTRUCTION
Michael J. Shannon, 130 Greenwood Ave., Bend, Oreg. 97701
Filed Jan. 21, 1969, Ser. No. 792,468
Int. Cl. A47c 4/02, 7/00, 7/54
U.S. Cl. 297—445 **14 Claims**

A furniture construction wherein a plurality of slab-like members having a box-like construction are edge-glued together at butt joints with high strength adhesive to form various articles of furniture such as chairs, sofas, beds, tables, dressers and the like. Each slab-like member is composed of a sandwich including outer layers of semi-rigid paper, wood or other thin sheet material separated



by an inner filler material such as cardboard or other honeycomb or cellular material and a laterally rigid edge strip.

3,606,461
MODULAR FURNITURE
Raymond Moriyama, 56 Indian Grove, Toronto 154, Ontario, Canada
Filed Nov. 3, 1969, Ser. No. 873,371
Int. Cl. A47c 1/12, 13/00, 7/02
U.S. Cl. 297—445 **10 Claims**

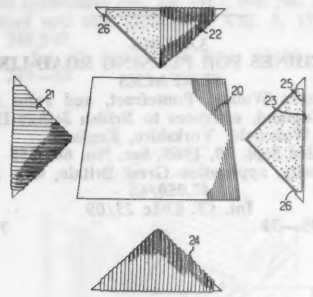


Modular furniture wherein the dimensions of each piece of furniture within a grouping are based on the dimensions of a cube, a one-half cube, or a one-quarter cube. The modular furniture may comprise a base element and a furniture function defining element in juxtaposed position thereto; and at least two of the effective dimensions of length, width and height of any one of the structural elements which goes to make up the modular furniture will equal at least two of those dimensions in another one of the structural elements which also goes to make up the modular furniture.

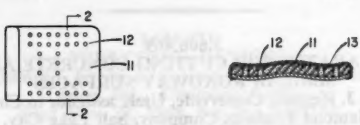
3,606,462
STRAW PLATE FOR PIECE OF FURNITURE SUCH AS CHAIR AS WELL AS CHAIRS FITTED WITH SAID PLATE
Pierre Bruniaux, 8 Rue des Bouchers, Cambrai, Nord, France
Filed Jan. 3, 1969, Ser. No. 794,470
Claims priority, application France, Apr. 4, 1968, 147,013; Sept. 23, 1968, 167,227
Int. Cl. A47c 7/02
U.S. Cl. 297—452 **18 Claims**

Straw plate for a piece of furniture such as a chair, made of as many free units as the pattern of the straw work desired necessitates, each unit being covered with coating fibre, adequate means being provided for the assembly of the covered units between them, which allows

to get rid of the manpower required for usual straw work in which covering fibres interlace, while a similar appearance of the chair plate is obtained when finished, said plate being self-bearing.

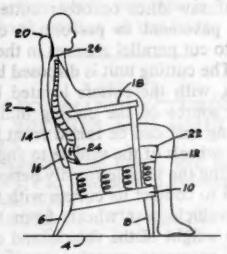


3,606,463
VEHICULAR SEATING SYSTEM USING BOUNCING PUTTY
William Thomas Brooks, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed May 21, 1969, Ser. No. 826,561
Int. Cl. A47c *27/20*; B60n *1/06*
U.S. Cl. 297—455 **6 Claims**



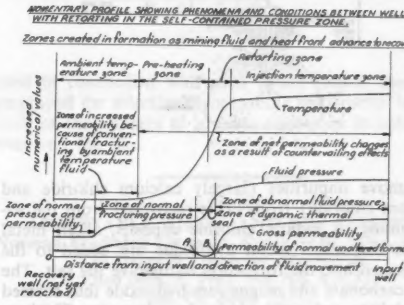
A vehicular seating system which comprises a rigid backing member supporting a cellular cushion of elastomeric material having a plurality of voids extending through the cushion, the voids being filled with silicone bouncing putty resiliently confined by the elastomer. The system is suitable for both land vehicles and aircraft and serves to limit injuries.

3,606,464
CHAIR
Theodore K. Arbuthnot, 3233 NE. 34th St., Apt. 1210, Fort Lauderdale, Fla. 33308
Filed Mar. 24, 1969, Ser. No. 809,562
Int. Cl. A47c *7/00, 7/20*
U.S. Cl. 297—460 **6 Claims**



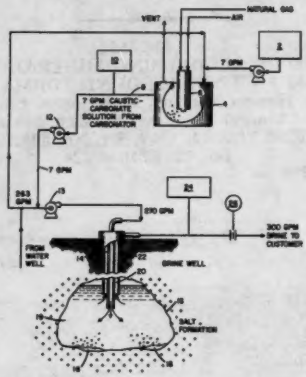
A chair having the length of the seat approximately equal to the distance from the front of the seat to the chair to the floor, with the sacral brace tilting backward at an angle of 95° from the floor to the sacral brace to support the sacrum, the seat tilting downwardly from the front of the seat to the back of the seat between five and eight degrees of declination, arm rests parallel to the seat with the relationship of the distance from the back of the arm rest to the back of the seat and the back of the seat to the floor at a ratio of three to five, and the back of the chair tilting backward at an angle of one hundred degrees from the floor to the back of the chair.

3,606,465
METHOD OF RECOVERING MINERAL VALUES FROM AN UNDERGROUND FORMATION
Alden W. Hanson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Mar. 12, 1969, Ser. No. 806,606
Int. Cl. E21b *43/24*
U.S. Cl. 299—4 **19 Claims**


MOMENTARY PROFILE SHOWING PHENOMENA AND CONDITIONS BETWEEN WELLS WITH RETORTING IN THE SELF-CONTAINED PRESSURE ZONE.
Zones created in formation as mining fluid and heat front advance to recovery well
ambient temperature zone
Pre-heating zone
Retorting zone
Injection temperature zone
Temperature
Increased numerical values
Zone of increased permeability because of conventional fracturing by ambient temperature fluid
Zone of net permeability changes as a result of countervailing effects
Fluid pressure
zone of normal pressure and permeability
zone of normal fracturing pressure
Zone of abnormal fluid pressure
zone of dynamic thermal seal
Gross permeability
Permeability of normal undisturbed formation
Distance from input well and direction of fluid movement
Recovery well (not yet reached)
Input well

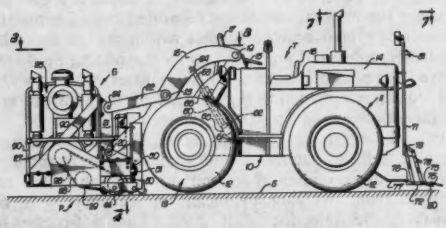
A heated fluid-pressurized zone in a substantially non-permeable underground earth formation, such as a clay-type shale, is substantially dynamically self-containing as to pressure and is largely retentive of fluids so long as it remains at a temperature at least 10 centigrade degrees, and preferably at least 100 centigrade degrees, above the ambient temperature of the formation. Such a self-contained zone when substantially static in size is useful as a storage place for gaseous or liquid materials such as natural gas, or brine. Such a self-contained, heated, fluid-pressurized zone, most generally when dynamically expanding, is useful in a process for mining hydrocarbon deposits, e.g., shale, or soluble mineral deposits, in a process wherein the mineral values are separated from the matrix material by heat and/or solvent action within the self-contained zone, and are taken up by the mining fluid employed for pressurization and heat transfer, with or without concurrent retorting on account of the temperature of the mining fluid or partial in situ combustion on account of oxygen supplied to carbon, hydrocarbon, and metallic sulfide material in the underground formation, and thereafter mining fluid and mineral values are recovered from the zone by means of recovery wells, or possibly, the injection well itself. The self-contained heated, fluid-pressurized zone is created by injecting at least 20,000 gallons of a mining fluid, such as, water, brine, oil or sulfuric acid, into a borehole in a substantially non-permeable underground formation at least 1000 feet deep over a period of at least 30 days with no more than temporary pumping stoppages, during which the pressure against the formation is substantially not relieved, and the mining fluid at the wellhead has a temperature at least 100 centigrade degrees above the temperature of the underground formation. Typically, pumping of a much larger volume is carried out over a one year period or more. The underground formation critically has an inherent permeability not substantially greater than a clay-type shale such as the Antrim shale.

3,606,466
SUBTERRANEAN BRINE PURIFICATION
Dudley P. Fernandes, Ypsilanti, Mich., assignor to Marathon Oil Company, Findlay, Ohio
Filed Dec. 4, 1969, Ser. No. 882,240
Int. Cl. E21b *43/28*
U.S. Cl. 299—5 7 Claims



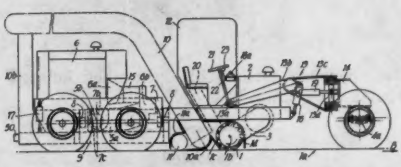
To remove impurities (largely calcium chloride and magnesium chloride) from brine recovered from the solution mining of sodium chloride deposits, alkali metal carbonate and alkali metal hydroxide are added to the water injected into the formation to dissolve the salt. The calcium carbonate and magnesium hydroxide thus formed will precipitate and settle within the salt cavity. Thickening agents or other coagulants can optionally be used to speed coagulation and settling.

3,606,467
MACHINES FOR CUTTING GROOVES IN CONCRETE AND SIMILAR ROADWAY SURFACES
Frank L. Christensen and Takeshi Mori, Salt Lake City, Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Aug. 19, 1969, Ser. No. 851,193
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 16 Claims



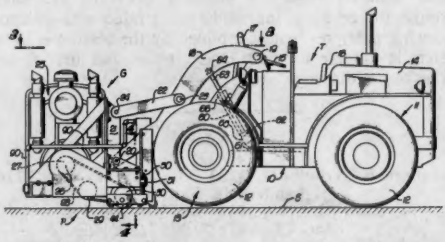
A four wheel vehicle carries a grooving unit that rotates a gang of saw discs or cutters in contact with a concrete pavement to cut parallel grooves therein to a desired depth. The grooving unit can be raised from the pavement to permit all four wheels of the vehicle to engage the roadway for transporting the vehicle rapidly between locations. The grooving unit is lowered to contact its saw discs with the pavement and elevate a pair of vehicle wheels (such as non-steerable wheels) from the pavement so that the entire weight of the vehicle and grooving unit is supported by the pavement engaging portions of the grooving unit and the other pair of steerable vehicle wheels, thereby insuring ample cutting weight and force of the saw blades against the pavement while the entire combination is moved by the powered steerable wheels along the pavement.

3,606,468
MACHINES FOR PLANING ROAD-LIKE SURFACES
William James Walker, Pontefract, and John Halbert, Ossett, England, assignors to British Jeffrey-Diamond Limited, Wakefield, Yorkshire, England
Filed Sept. 29, 1969, Ser. No. 861,555
Claims priority, application Great Britain, Oct. 3, 1968, 47,050/68
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 7 Claims



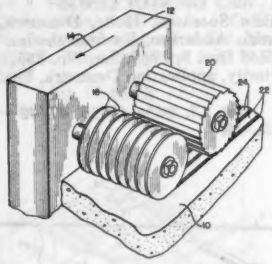
A machine for planing a road-like surface includes a cylindrical cutting element incorporating cutting pick means. The cutting element is mounted in said machine for rotation about the longitudinal axis of the element and is mounted in such manner that the cutting pick means can be brought into engagement with the road-like surface.

3,606,469
APPARATUS FOR CUTTING CONCRETE AND SIMILAR ROADWAY SURFACES
Warren J. Hughes, Centerville, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Sept. 5, 1969, Ser. No. 855,538
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 20 Claims



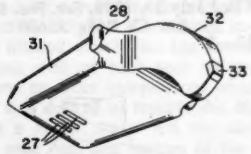
A four wheel vehicle carries a cutting unit that rotates a gang of saw discs or other cutters in contact with a concrete pavement to perform a cutting action thereon, such as to cut parallel grooves in the pavement to a desired depth. The cutting unit is disposed behind the vehicle rear wheels, with the cutters located between such wheels, a power source of the cutting unit rotating the cutters. The cutting unit can be raised from the pavement to permit all four wheels of the vehicle to engage the roadway for transporting the vehicle rapidly between locations. It can be lowered to contact its cutters with the pavement and elevate the vehicle rear wheels from the pavement so that the entire weight of the vehicle and cutting unit is supported by the pavement engaging portions of the cutting unit and the vehicle steerable front wheels, thereby insuring ample cutting weight and force of the cutters against the pavement while the entire combination is moved by the powered steerable wheels along the pavement.

3,606,470
ROCK SAMPLING
Philip Blum, Lexington, Mass., assignor to National Research Corporation
Original application Jan. 24, 1967, Ser. No. 611,414. Divided and this application Aug. 6, 1968, Ser. No. 768,942
Int. Cl. B28d *1/18*; E21c *13/00*
U.S. Cl. 299—67 4 Claims



An apparatus for sampling rock and other brittle materials and for controlling resultant particle sizes. The device includes grinding means for cutting grooves in the rock surface and to provide a grouping of thin, shallow, parallel ridges and cutter means to reduce these ridges to a powder specimen. Collection means is provided for the powder.

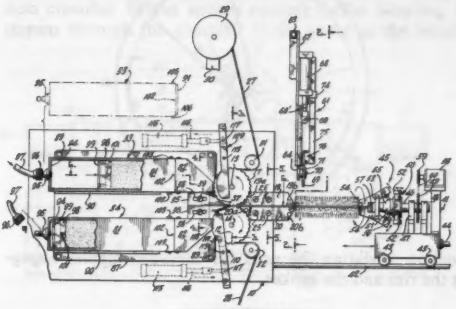
3,606,471
TRENCHING DEVICES
Clifford J. Evans, Glen Rose, Tex., assignor to Jetco, Inc., Alhambra, Calif.
Filed Mar. 25, 1969, Ser. No. 810,214
Int. Cl. E21c *37/18*; E02f *9/28*
U.S. Cl. 299—79 4 Claims



A curved tooth for use on a moving excavation apparatus having a tapered contact point of hardened material which is about one-half to one-fourth the width of the shank portion of the body of the tooth, the thickness of the digging portion being non-tapering and at least as thick as the shank portion of the body.

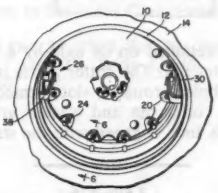
3,606,472
APPARATUS FOR MANUFACTURING ARTICLES SUCH AS BRUSHES AND SIMULATED TREE BRANCHES
Edward J. Rutkowski, Old Forge, and Edward R. Johnson, Levittown, Pa., assignors to Poloron Products, Inc., New Rochelle, N.Y.
Filed Jan. 27, 1970, Ser. No. 6,134
Int. Cl. A46d *9/00*
U.S. Cl. 300—2 12 Claims

Apparatus for manufacturing simulated tree branches, brushes and the like utilizing picker wheels, means for continuously feeding wires about said wheels with the wires emerging from between and tangentially of said wheels and bristle feeding means for feeding bristles to said picker wheels wherein the feeding means includes a hopper and means for interchanging hoppers without interrupting operation of the apparatus. When hoppers are



used in connection with each picker wheel, means are employed for selectively controlling the bristles fed from each of the hoppers to provide variations in color, contour and the like.

3,606,473
ADJUSTABLE WHEEL AND RIM ASSEMBLY
Norman Frederick Lemmon, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Nov. 5, 1969, Ser. No. 874,137
Int. Cl. B60b *23/12*
U.S. Cl. 301—9TV 1 Claim

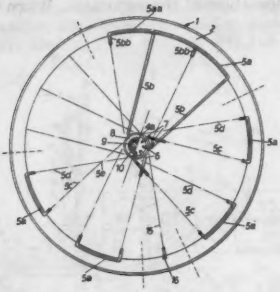


A rim having axially spaced apart seats on its inner periphery is selectively axially positionable on a wheel by means of releasable seat-engaging clamps and means cooperates between the wheel and rim to guide the rim axially during shifting and to prevent axial escape of the wheel from the rim.

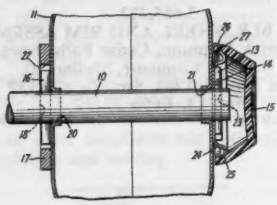
3,606,474
WHEELS
Ian G. Meiklejohn, Kirkcaldy, Fife, Scotland, assignor to I. G. Meiklejohn & Company Limited, Kirkcaldy, Fife, Scotland
Filed June 30, 1969, Ser. No. 837,515
Claims priority, application Great Britain, July 3, 1968, 31,815/68
Int. Cl. B60b *1/04*
U.S. Cl. 301—60 9 Claims

A wire-spoked wheel of the type used on perambulators, golf caddie carts, cycles and the like, wherein a plurality of wire spokes engage a rim and extend substantially radially to an axle bearing assembly comprising a hub tube and sleeving within the hub tube, the inner end portions of the spokes being received in apertures in the hub tube and having axial portions anchored

between the sleeving and the hub tube so that the rim is rigidly supported on the axle bearing assembly, the construction obviating the need for threaded nipples engaging the rim and the spokes.

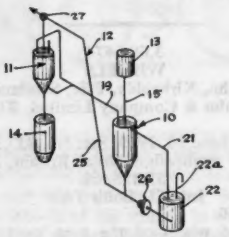


3,606,475
WHEEL ASSEMBLY
Carter E. Quisenberry, Olney, Ill., assignor to AMF Incorporated
Filed Aug. 6, 1969, Ser. No. 847,911
Int. Cl. B60b *27/06*
U.S. Cl. 301—112 5 Claims



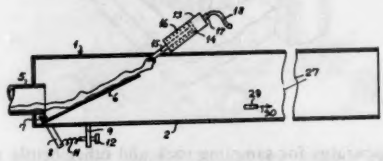
The wheel is retained on its axle by a flanged washer and straight cotter pin. The cotter pin is inserted into the axle cotter pin hole through a slot formed in the washer flange, and the cotter pin and washer are covered by a hub cap which is snap engaged with the washer flange.

3,606,476
FLUIDIZED LEAD SHOT CONVEYER
Walter R. Krueger and Allen H. Rogers, Lake Jackson, Tex., assignors to Nalco Chemical Company, Chicago, Ill.
Filed July 24, 1970, Ser. No. 58,000
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 9 Claims



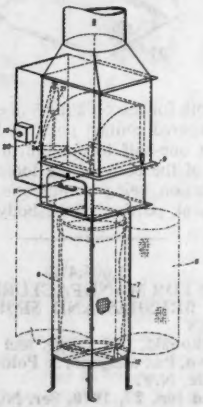
A conveyer for transporting lead shot from a lead shot manufacturing facility to an electrolytic cell lead shot hopper includes a feed vessel receiving lead shot and an organic liquid for wetting the lead shot, and an outlet for the vessel. The wetted lead shot is gravitationally fed from the vessel outlet into a main pipeline being charged with the organic liquid under pump pressure to fluidize the lead shot and move it in the pipeline to the cell hopper. A drain is provided in the hopper for removing the liquid from the lead shot, and an outlet at the bottom of the hopper allows the lead shot to be discharged into the cell.

3,606,477
APPARATUS FOR THE FLAT LAYING OF STOCKINGS
Nels Hartmann Sorensen, Holte, Denmark, assignor to Hans Christian Anderson, Kastanienbaum, Switzerland
Filed Dec. 9, 1969, Ser. No. 883,399
Claims priority, application Denmark, Dec. 10, 1968, 6,039
Int. Cl. B65g *47/36, 47/42*
U.S. Cl. 302—2R 5 Claims



An apparatus for the flat laying of stockings in which the stockings are conveyed by a flow of air to one end of an elongated container, a guide means being provided at that end of the container to guide the stocking in an upwardly inclined path towards a gripping needle at the top wall of the container, while permitting the bulk of the stocking to continue its movement through the container so as to be straightened by a direct continutaion of the flow of air by means of which the stocking was conveyed to the container.

3,606,478
TRASH AND REFUSE DEPOSITORY SYSTEM
Bruce T. E. Boon, Wayne, N.J., assignor to Eastern Cyclone Industries, Inc., Fairfield, N.J.
Filed July 23, 1970, Ser. No. 57,590
Int. Cl. B65g *53/00*
U.S. Cl. 302—2 10 Claims



A novel pneumatic, automatic trash and refuse depository system and station which comprises a bag for receiving trash and refuse positioned for the introduction of the trash. Door means are also provided to be opened when desired so as to impose a vacuum pressure on the

bag to remove it from the perforated or mesh support and to introduce the bag containing the trash and refuse into the conveying system for transmission to a central collection station.

3,606,479

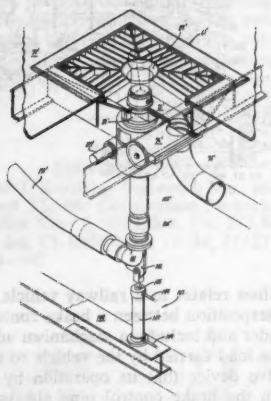
METHOD AND APPARATUS FOR THE STORAGE AND PULPING OF MATERIAL ORES AND COMPARABLE PARTICULATE MATTER

Charles W. Robinson and Glenn E. Craig, San Francisco, and Emmett J. Murphy, Woodside, Calif., assignors to Marcona Corporation, San Francisco, Calif.

Continuation-in-part of application Ser. No. 827,300, May 23, 1969. This application July 10, 1969, Ser. No. 863,001

Int. Cl. B65g *53/30*

U.S. Cl. 302—16 33 Claims



Method for the storage, handling and pulping of discrete or particulate minerals (e.g. iron ore solids) and comparable particulate matter. Assuming that the mineral solids are to be stored on a ship or like carrier, the ship is provided with cargo carrying holds having bottom and side walls forming storage vessels into which the mineral solids are introduced. In a shore based installation, a storage vessel is utilized which also has bottom and side walls. The bottom wall of each such storage vessel is equipped with one or more sumps from which slurry is removed. When it is desired to remove the discrete mineral solids from a vessel, water jets are discharged to form a pulping zone near the bottom of the vessel and directly overlying its bottom. These water jets are directed and traversed in such a manner that the solid minerals are acted upon and pulped progressively in the pulping zone, and the zone is moved as the water jets are traversed to thereby progressively cover all of the region overlying the entire bottom wall. Simultaneously, the freshly formed slurry is removed as rapidly as possible to prevent flooding. As the freshly formed slurry is removed, the remainder of the overlying solids progressively move downwardly to the pulping zone under the influence of gravity, and may slide or cave in in such a manner that the energy of the fall aids in breaking up the material.

3,606,480

DROPOUT SWITCH

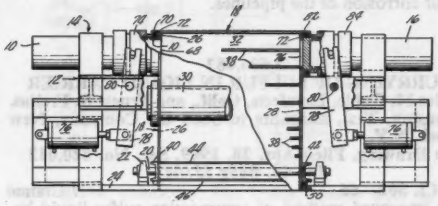
Edgar A. Barber, Newaygo, Mich., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 4, 1970, Ser. No. 16,513

Int. Cl. B65g *53/04*

U.S. Cl. 302—28 12 Claims

A switch for directing a stream of fluidized particulate material from a pipeline conveyor pipe either through a bypass conduit to a continuation of the pipe or through an enlarged conduit to a receptacle or hopper. The conduits form a unit pivoted to swing transversely of the conveyor pipe and selectively align and connect either the bypass conduit inlet or the enlarged conduit inlet with the conveyor pipe. The enlarged conduit forms an expansion chamber having stream turning baffles directing the stream through the chamber to an outlet in the bottom.



The outlet carries an O ring seal member which is forced into sealing relation around a discharge passageway in a plate, forming the upper portion of a hopper, by the swinging movement of the switch and seals the joint between the chamber outlet and the plate. The pivot is positioned at one side of the switch member center of gravity so that the weight of the switch member will assist in the sealing. The seal mechanism for the bypass outlet is used to resist the end thrust on the switch.

3,606,481

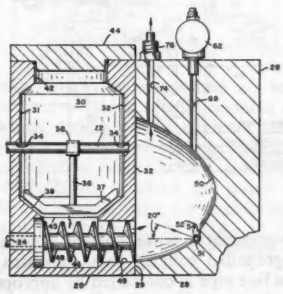
POWDER FEEDING ASSEMBLY

Mille Stand, New York, and Albert H. Streicher, Bronx, N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,487

Int. Cl. B65g *53/40*

U.S. Cl. 302—50 3 Claims



A powder feed assembly having a housing provided with a powder reservoir and a powder fluidizing chamber. The reservoir has a sump at its lower end and a conveyor in the sump to deliver powder to the fluidizing chamber. A conduit delivers a carrier gas under pressure to the chamber. Another conduit connects the chamber with the reservoir to equalize the pressure therein and valve means can vary the pressure. There is also a valve for rapidly venting pressure in the chamber intermittently and a delivery conduit from its chamber for the fluidized powder.

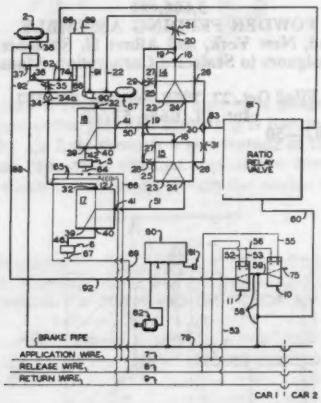
3,606,482
SULFUR-HYDROCARBON SLURRY PIPELINE TRANSPORTATION CONTAINING CORROSION AND PLUGGING INHIBITORS
Mary Frances Vondrak, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Oct. 30, 1968, Ser. No. 774,218
Int. Cl. B65g *65/04*
U.S. Cl. 302—66 7 Claims

An improved method of transporting sulfur-liquid hydrocarbon slurries through pipelines without causing plugging or corrosion of the pipelines.

3,606,483
SLURRYING OF SULFUR IN LIQUID CARRIER
Charles M. Gable, Layafette, Calif., and Ernest R. Freitas, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Apr. 28, 1969, Ser. No. 820,012
Int. Cl. B65g *53/04*
U.S. Cl. 302—66 7 Claims

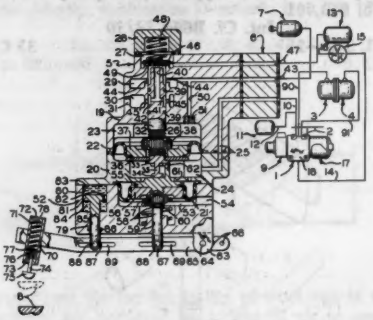
An improved method of transporting sulfur-liquid hydrocarbon slurries through pipelines without causing sulfur agglomeration, sticking, deposition or plugging of the pipeline.

3,606,484
FLUIDIC CONTROL SYSTEM FOR VEHICLE BRAKES
Edward T. Dressler, Jr., Mars Estates, Essex, Md., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Jan. 2, 1970, Ser. No. 247
Int. Cl. B60t *13/68, 13/70*
U.S. Cl. 303—20 23 Claims



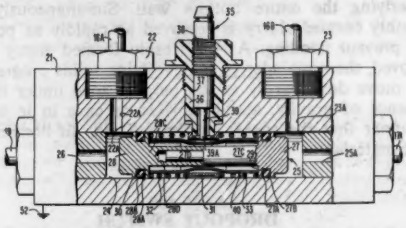
An electro-pneumatic brake control apparatus for a train of self-propelled coupled cars, in which the pressure in a train line pipe is controlled by appropriate energization and deenergization of release and application magnet valve devices provided on each car in the train for supplying fluid under pressure locally to the train pipe or releasing fluid under pressure therefrom. The energization and deenergization of the magnet valve devices is controlled via train line wires by pneumatically operated switch devices on the lead car in the train. These switch devices are selectively operated by a plurality of pure fluid devices in correspondence to the operation of a brake valve also on the lead car to establish suitable control circuitry via the train line wires to the release and application magnet valve devices so as to cause either the charging of or a reduction of pressure in the train line pipe, it being understood that variations of the fluid pressure in the train line pipe are effective to control brake applications and brake releases on the cars in the train.

3,606,485
EMPTY-LOAD RELAY VALVE DEVICE
Daniel G. Scott, Apollo, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Dec. 29, 1969, Ser. No. 888,583
Int. Cl. B60t *8/18*
U.S. Cl. 303—23 15 Claims



This invention relates to a railway vehicle relay valve device for interposition between a brake control pipe and a brake cylinder and includes a mechanism adjustable according to the load carried by the vehicle to so condition the relay valve device that its operation by fluid under pressure from the brake control pipe always provides a supply of fluid pressure to the brake cylinder, the value of which is in accordance with the weight of the load carried by a spring-supported (or sprung) part of the vehicle between which and an unsprung part, the relay valve device is interposed for effecting operation of the load-measuring mechanism thereof in accordance with changes in the load carried by the spring-supported part.

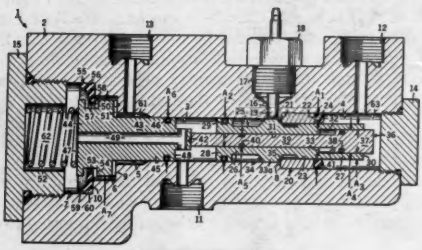
3,606,486
BRAKE INDICATING SAFETY VALVE
Roger E. Doerfler, Baltimore, Md., assignor to Hydrasearch Co., Inc., Annapolis, Md.
Filed Oct. 28, 1969, Ser. No. 871,844
Int. Cl. B60t *11/34, 17/22*
U.S. Cl. 303—6C 8 Claims



This patent discloses a pressure differential or brake indicating safety valve particularly adapted for use in hydraulic brake systems having dual master brake cylinders. The valve is adapted for use on motor vehicles having either all shoe, all discs, or hybrid (a brake system

having disc brakes on one set of wheels and shoe brakes on the other set of wheels) brake systems. The pressure differential valve includes a tubular body having an axially extending bore and mounted therein pressure responsive means which are slidably disposed in the bore. First and second hydraulic fluid inlets are connected respectively to opposite ends of the pressure responsive means and the inlets, or other apertures in communication therewith, may be connected by conventional hydraulic piping to the front and rear brakes respectively of the brake system, and to the outlets of the dual master cylinder. Switch means are mounted in the housing and switch actuating means are carried by the pressure responsive means, there being indicating means, in the present instance lights and the like, connected to the switch means. In addition, there are means for maintaining the switch actuating means in its actuated position upon a predetermined pressure differential occurring between the first and second inlets which causes the switch actuating means to engage the switch means. The valve is adapted to receive a metering valve, or a proportioning valve, or a combination of each without necessitating major modification.

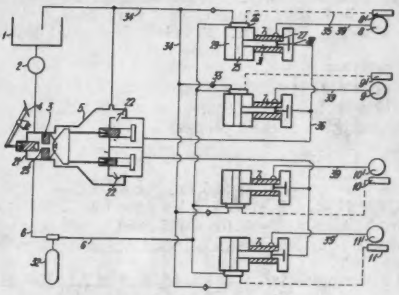
3,606,487
CONTROL VALVE
Raymond J. Kersting, Dellwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.
Filed Nov. 4, 1969, Ser. No. 873,900
Int. Cl. B60t *8/26, 11/34, 17/22*
U.S. Cl. 303—6C **15 Claims**



A control valve for use in a dual or split brake system having a switch operating piston movable from a centered position toward opposed translated positions in response to a predetermined differential between separately supplied fluid pressures acting thereon. The switch operating piston also includes driving means subjected to the separately supplied fluid pressures and drivingly engaged with a metering piston, said driving means being responsive to the supplied fluid pressures in excess of a predetermined value to drive said metering piston toward a position effecting a metered application through said control valve of one of the supplied fluid pressures.

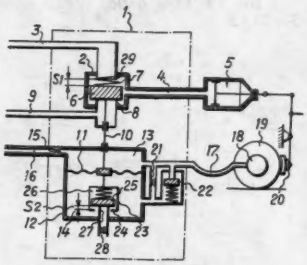
3,606,488
ANTISKID BRAKE SYSTEM FOR VEHICLES
Friedrich Paul Beuchle, Frankfurt am Main, and Otto Depenheuer, Bad Homburg, Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jan. 15, 1970, Ser. No. 3,119
Claims priority, application Germany, Jan. 17, 1969, P 19 02 186.4
Int. Cl. B60t *8/12, 13/14*
U.S. Cl. 303—21F **5 Claims**

An antiskid control for a pump powered hydraulic brake including a valve in each brake line for cutting off brake pressure and releasing the pressure in response to a wheel deceleration threshold signal. Each valve is movable by a hydraulic actuator having a movable partition



forming two chambers. The brake booster may be connected to either chamber to open or close the valve depending on the deceleration signal.

3,606,489
ANTISLIP DEVICE FOR A COMPRESSED AIR BRAKE
Siegfried Keller, Effretikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed Mar. 10, 1970, Ser. No. 18,065
Claims priority, application Switzerland, Mar. 26, 1969, 4,564/69
Int. Cl. B60t *8/12*
U.S. Cl. 303—21CG **4 Claims**

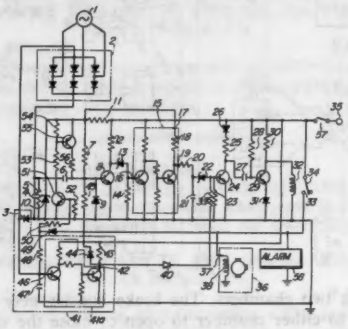


An antislip device for compressed air brakes with a double-seated valve having a valve member connected to a piston which divides a first chamber communicating with a deceleration detector from a second chamber which is in communication with the first chamber through a throttling constriction, in which the piston is connected to a part of a telescopic valve for exhausting the second chamber, and the length of the stroke of the telescopic valve is less than the length of the stroke of the valve member of the double-seated valve.

3,606,490
ANTI-SKID CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES
Noriyoshi Ando, Kariya-shi, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan
Filed Dec. 17, 1968, Ser. No. 784,351
Claims priority, application Japan, Jan. 25, 1968, 43/4,521; Apr. 8, 1968, 43/23,255
Int. Cl. B60t *8/08*
U.S. Cl. 303—21BE **10 Claims**

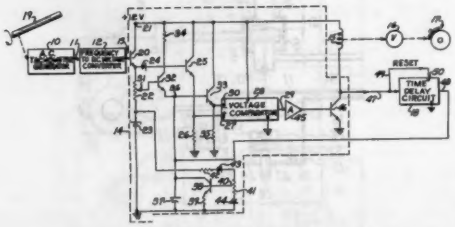
An anti-skid control system for automotive vehicles, which is operative in such a manner that when the angular deceleration of the wheel has reached a value

equal or higher than a first set value for which the angular deceleration is to be detected, a braking force applied to the wheel is released and at the same time said set value is elevated to a second higher set value,



and further when the angular deceleration of the wheel has reached said set value and the wheel has stopped rotating, the released braking force state is maintained with the braking force being applied to the wheel again when the wheel has started rotating.

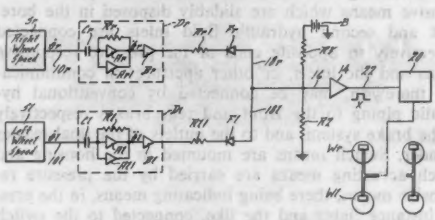
3,606,491
ANTI-WHEEL LOCK BRAKE CONTROL FOR AUTOMOTIVE VEHICLE
William J. Walsh, Birmingham, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Feb. 24, 1969, Ser. No. 801,556
Int. Cl. B60t *8/08, 17/22*
U.S. Cl. 303—21AF **13 Claims**



Anti-wheel lock control for the braking system of an automotive vehicle to avoid skidding by releasing the rear brakes if the rotational wheel velocity becomes significantly less than the apparent ground velocity of the vehicle. The anti-wheel lock control is temporarily disabled by a time delay circuit if the rear brakes are not re-applied automatically within a time interval sufficient for the wheel lock-up condition to be relieved. This time delay circuit monitors the performance of the anti-wheel lock control and also corrects the errors in the apparent vehicle velocity caused by travel downhill or uphill.

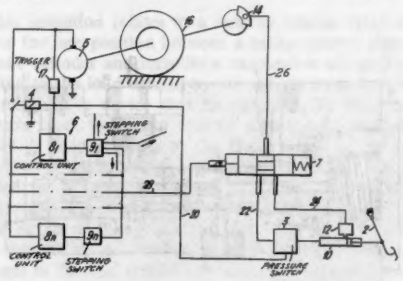
3,606,492
SKID CONTROL SYSTEM
Edward J. Hayes, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Mar. 7, 1969, Ser. No. 805,318
Int. Cl. B60t *8/08*
U.S. Cl. 303—21EB **13 Claims**

A skid control system for a wheeled vehicle having a plurality of wheels and a brake system for the wheels with at least two of the wheels being connected to a common brake pressure modulating device which is actuated to relieve brake pressure in response to both of the two wheels being in a skid condition and in one form, actuated to reapply brake pressure in response to either of the two



wheels spinning up or, in another form, actuated to reapply brake pressure in response to both of the two wheels spinning up.

3,606,493
ANTI-SKID BRAKE SYSTEM
Erwin Schlitz, Heusenstamm, and Werner Fink, Frankfurt am Main, Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed July 25, 1969, Ser. No. 845,013
Claims priority, application Germany, Aug. 2, 1968, P 17 80 121.7
Int. Cl. B60t *8/08*
U.S. Cl. 303—21CF **3 Claims**

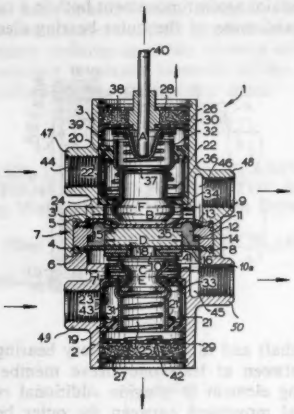


A speed dependent anti-skid brake control system for vehicles having hydraulic brakes, including a voltage generator for producing a voltage signal proportional to wheel speed and a series of controls responsive to different voltage signal levels for controlling brake pressure. The controls are successively operated, either in response to a timer or reduced brake pressure, to provide stepped regulation at a series of decreasing speed levels.

3,606,494
MULTI-CYCLE CONTROL VALVE ASSEMBLY
Kurt Frank, Stuttgart-Feuerbach, and Wilfried Kirchner, Backnang, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Aug. 28, 1969, Ser. No. 853,891
Claims priority, application Germany, Sept. 19, 1968, P 17 80 480.7
Int. Cl. B60t *15/04, 13/26*
U.S. Cl. 303—52 **10 Claims**

A two-cycle control valve assembly for compressed air comprises a plunger which can be moved axially with reference to the valve body to thereby open a first inlet valve which admits compressed air to a first consumer. The resulting pressure buildup in the body causes a composite diaphragm and a reducing element between the components of the diaphragm to effect the opening of a second inlet valve which admits compressed air to a second consumer. If the pressure buildup fails to materialize

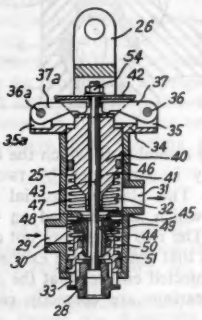
on mechanical opening of the first inlet valve, the reducing element effects mechanical opening of the second inlet valve. The resistance which an operator meets to displacement of the plunger is the same regardless of whether both cycles are operative or whether the one or the other cycle is out of commission.



3,606,495
PRESSURE FLUID CONTROL VALVE

Jacques Bion, Aulnay-sous-Bois, France, assignor to Societe Anonyme dite: Compagnie des Freins et Signaux Westinghouse

Filed June 17, 1969, Ser. No. 834,038
Claims priority, application France, June 17, 1968, 155,225
Int. Cl. B60t *13/36*
U.S. Cl. 303—54 **6 Claims**



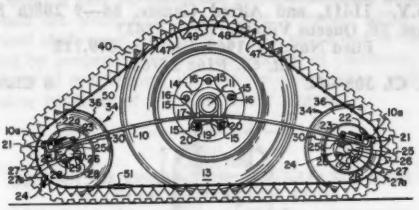
A pressure fluid control valve arranged to be connected in mechanical brake linkage of a tractor to control a supply of pressure fluid to a pressure fluid operated trailer brake has a flap member opened by brake forces in the linkage via a piston, the pressure fluid passed by the valve tending to close the flap member, and force transmitting levers fulcrumed on a body portion of the device to transmit forces between the body portion, the piston and an actuator rod.

3,606,496
TRACK UNIT FOR WHEELED VEHICLES

Cal J. Haycock, 591 Malibu Drive, Salt Lake City, Utah 84107

Filed Jan. 21, 1969, Ser. No. 792,311
Int. Cl. B62d *55/16*
U.S. Cl. 305—29 **3 Claims**

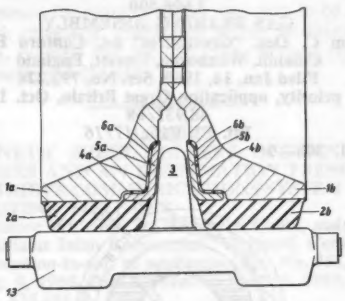
An adapter unit comprising a spring-type support beam, a guide roller resiliently carried by the beam, and arranged to be aligned with a vehicle drive wheel, and an endless track adapted to fit around the drive wheel and roller and to be powered by operation of the drive wheel.



3,606,497
WEAR-PROTECTED WHEEL FOR A TRACKLAYING VEHICLE

Martin Gilles, Cologne-Weidenpesch, Germany, assignor to Franz Clouth Rheinische Gummewarenfabrik AG, Cologne-Nippes, Germany

Filed Jan. 22, 1969, Ser. No. 793,013
Claims priority, application Germany, Jan. 26, 1968, P 16 80 323.9
Int. Cl. B62d *55/14*
U.S. Cl. 305—56 **7 Claims**

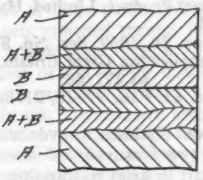


A wheel for a tracklaying vehicle has two flanges defining an annular recess for two cushions, each of which includes a steel ring and a rubber layer bonded to the ring and to one of the flanges. The teeth of the track enter the gap between the steel rings.

3,606,498
BEARINGS

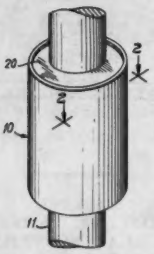
John M. Ohno, Plymouth, Mich., assignor to The Bendix Corporation

Continuation of application Ser. No. 582,818, Sept. 29, 1966. This application Mar. 3, 1969, Ser. No. 808,363
Int. Cl. F16c *25/02, 33/24*
U.S. Cl. 308—3R **12 Claims**



Bearings and the like for high vacuum, high temperature environments having at least one bearing surface of zirconium, ruthenium or uranium.

3,606,499
ANTIFRICTION BEARING ASSEMBLY HAVING AN ORBITING ROLLER ARRANGEMENT
Herman Ganser, 116—19 219th St., Cambria Heights, N.Y. 11411, and Alfred Ganser, 86—9 208th St., Apt. 2F, Queens Village, N.Y. 11427
Filed Nov. 25, 1969, Ser. No. 879,712
Int. Cl. F16c *29/00*
U.S. Cl. 308—6C 6 Claims



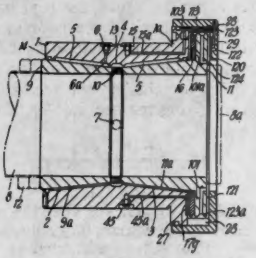
An antifriction linear bearing assembly for receiving a cylindrical guide pin or post consisting of a plurality of spaced-apart segments having endless raceways for receiving a plurality of concave roller bearings which recirculate or orbit within the raceways in response to the movement of the bearing assembly or guide pin.

3,606,500
GAS BEARING ASSEMBLY
William C. Dee, "Greenacres" 64, Canford Bottom, Colehill, Wimborne, Dorset, England
Filed Jan. 14, 1969, Ser. No. 792,220
Claims priority, application Great Britain, Oct. 15, 1968, 48,931/68
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 1 Claim

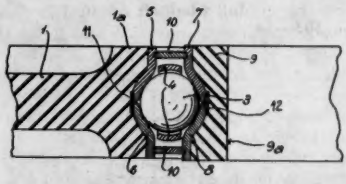
A fluid bearing has two or more gas feed slots opening at one or more axial positions into a bearing gap defined between two relatively movable bearing members, the slots being defined between two contiguous elements of one of the bearing members.

3,606,501
HYDROSTATIC BEARING ASSEMBLIES
Gerald Andrew Pearson Waplington, Colchester, England, assignor to Gamet Products Limited, Hythe, Colchester, Essex, England
Filed Nov. 20, 1969, Ser. No. 878,277
Claims priority, application Great Britain, Dec. 24, 1968, 61,277/68
Int. Cl. F16c *17/10, 21/00*
U.S. Cl. 308—122 36 Claims

The specification discloses a hydrostatic bearing assembly in which two frusto-conical sleeve members are mounted on a shaft in axial relationship with the frusto-conical surfaces converging towards their adjacent ends, the frusto-conical sleeve members being mounted within an outer bearing element having a pair of frusto-conical surfaces complementary to the frusto-conical surfaces of the sleeve members and in opposed relationship thereto, means being provided to form hydrostatic pads between each pair of opposed frusto-conical surfaces, said pads providing restaint against movement both in a radial sense and in an axial sense of the outer bearing element relative to the shaft and in which auxiliary bearing means is provided between at least one sleeve member and the outer bearing element to provide additional restraint to relative axial movement between the outer bearing element and the shaft in at least one sense of axial direction.



3,606,502
ANTIFRICTION BEARING ASSEMBLY
Hubert de Germond, Villa "Les Presles," Menthon-Saint-Bernard, Haute-Savoie, France
Filed Aug. 25, 1969, Ser. No. 852,611
Claims priority, application France, Aug. 30, 1968, 50,345
Int. Cl. F16c *13/06*
U.S. Cl. 308—196 7 Claims



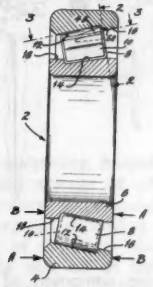
A ball bearing assembly in which the outer race of the bearing assembly is constituted by two outer annular, metallic cheeks. The plastics material is injected onto the two cheeks which are mounted on the ball bearings inside a mould. The two cheeks are not connected rigidly to each other so that the pressure exerted by the plastics material being injected ensures that the cheeks in contact with the ball bearings are correctly centered.

3,606,503
ROLLING BEARING
Sture Asberg, Savedalen, Sweden, and Hendrikus J. M. Timmer, Ede, Netherlands, assignors to Aktiebolaget Svenska Kullagerfabriken, Goteborg, Sweden
Filed Mar. 17, 1969, Ser. No. 807,545
Claims priority, application Norway, Nov. 14, 1968, 16,232, 16,233
Int. Cl. F16c *43/06*
U.S. Cl. 308—198 6 Claims

A rolling bearing assembly comprising inner and outer annular members spaced apart to define a space between

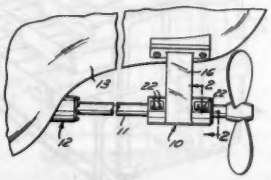
said annular members having confronting circumferentially extending raceways, a plurality of rolling elements in the space between the annular members, a support member for each of said annular members, means securing the annular members to their respective support member, and means defining an access opening in one of said annular members to permit assembly of the rolling elements therethrough into the annular space.

3,606,504
UNITIZED TAPERED ROLLER BEARING AND METHOD OF ASSEMBLING THE SAME
Stanley Wojciechowski, 4508 Edwin Drive NW., Canton, Ohio 44718
Filed Mar. 19, 1970, Ser. No. 21,169
Int. Cl. F16c *19/14*
U.S. Cl. 308—214 **17 Claims**



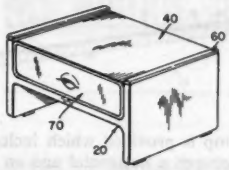
A unitized tapered roller bearing has a cup and cone provided with tapered raceways along which tapered rollers run. The cup at the large diameter end of its raceway is provided with an integrally formed thrust rib, and, likewise, so is the cone at the small diameter end of its raceway. Individual separators are positioned between the rollers to maintain the proper circumferential spacing between those rollers, and those separators are retained in the bearing by the thrust ribs. The separators, however, may be distorted sufficiently to enable them to pass between the cup thrust rib and the cone and into the space between the raceways, thus enabling assembly of the bearing.

3,606,505
MARINE BEARING
James Glenn Satterthwaite, 1 Dogwood Trail, Chesapeake, Va. 23320, and James B. Macy, Jr., 107 Holly Lane, Morehead City, N.C. 28557
Continuation-in-part of application Ser. No. 515,395, Dec. 21, 1965, now Patent No. 3,407,779, dated Oct. 29, 1968. This application July 17, 1967, Ser. No. 653,796
Int. Cl. F16c *27/00*
U.S. Cl. 308—238 **16 Claims**



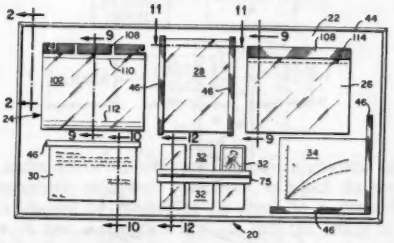
A marine bearing provided with a plurality of staves formed entirely of elastomeric material. The staves are assembled in a housing with clearance and are then subjected to releasable compressive stress to produce locking pressure between the exterior of each stave and the interior of the housing. The compressive stress may be applied radially or axially. The stave may be formed of concentric layers of different hardness or compounding. Close tolerances and small clearances may be provided because the bearing may be assembled and disassembled in place around the shaft. Critical resonant vibration within the normal shaft speed operating range is minimized or eliminated by properly selecting the amount of clearance, the amount of prestressing, the relative composition, and the relative hardness of the elastomeric material.

3,606,506
MODULAR UNITS FOR FURNITURE AND CABINET CONSTRUCTION
Nicholas A. Ungaro, Louisville, Ky., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Mar. 5, 1969, Ser. No. 804,499
Int. Cl. A47b *77/00*
U.S. Cl. 312—111 **19 Claims**



A plurality of modular units, fabricated from high impact strength plastic are provided with integrally formed means for enabling the various units to be securely though releasably interlocked in the construction of furniture, cabinets and the like, using various combinations of said modular units.

3,606,507
MAGNETIC SHEET HOLDERS, OPEN-ENDED SLIDES AND AN INFORMATION PRESENT-RETRIEVE COMMUNICATIONS SYSTEM EMPLOYING THE SAME
Paul Gilmore Williams, Jr., Westport, Conn., assignor to Williams Inlan Corporation, Westport, Conn.
Continuation-in-part of application Ser. No. 751,278, Aug. 8, 1968. This application May 19, 1969, Ser. No. 825,896
Int. Cl. A47b *63/00;* **G09f** *3/18*
U.S. Cl. 312—184 **9 Claims**



An integrated system for presenting and retrieving moveable pictures or icons. A transparent suspension file folder has magnets attached thereto for instant display of material on a iron plate display board.

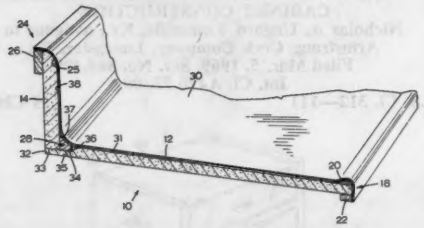
The iron surface of the display board is covered with a washable plastic material so that it can be written on with washable ink. The magnets are so placed on the file folder that they cooperate in temporarily affixing the same against the iron bed of an opaque, or the iron frame of a transparency, projector.

Magnetic instant display transparent art folders are also disclosed.

One form of magnet disclosed is a U-shaped magnetic spine which is easily attachable and detachable from the

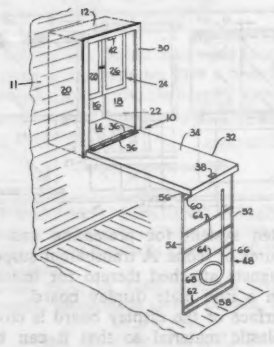
transparent file folders of the invention. Another takes the form of one or two, preferably flexible, magnetic strips adhered to one side of a transparent file folder along one or both the long edges thereof.

3,606,508
COUNTER TOP
Harry E. Burnes, 34 Highway Ave., London, Ontario, Canada
Filed Dec. 24, 1969, Ser. No. 887,930
Int. Cl. A47b *96/18*
U.S. Cl. 312—140.3 5 Claims



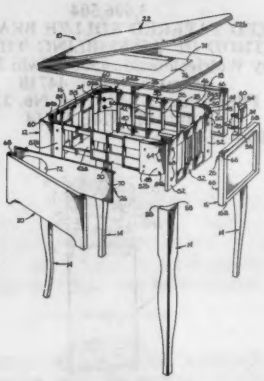
A counter top is provided which includes a relatively strong joint between a horizontal and an upright section. The counter top includes a base structure which is preferably made by attaching unfinished strips to a panel and then forming the required curves on the strips and the panel. The panel is then cut longitudinally to form the horizontal and upright sections and the sections are then glued together. The horizontal section has a recessed step at the joint between the sections and a filler strip is glued in the recess and to the front face of the upright section. The filler strip has a concave curve which merges smoothly into the exposed adjacent surfaces of the horizontal and upright sections for supporting a laminate of plastic or the like.

3,606,509
WALL CABINET
Thomas H. Bennett, 202 DeWitt St., Buffalo, N.Y. 14213
Filed Sept. 18, 1969, Ser. No. 858,941
Int. Cl. A47b *67/02, 85/00*
U.S. Cl. 312—242 4 Claims



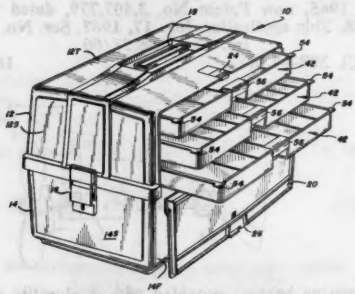
A self concealing wall cabinet adapted to be fitted into a wall recess. The cabinet is provided with a hingedly mounted closure panel for covering the opening of the cabinet and which is utilized as a serving platform or bar when extended. A support in the form of a decorative plaque is suspended in front of the closure panel in its horizontal extended position of use.

3,606,510
MODULAR FURNITURE EMBODYING A COMMON CHASSIS AND INTERCHANGEABLE STYLING FEATURES
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, New York, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,119
Int. Cl. A47b *43/00, 47/00*
U.S. Cl. 312—257 17 Claims



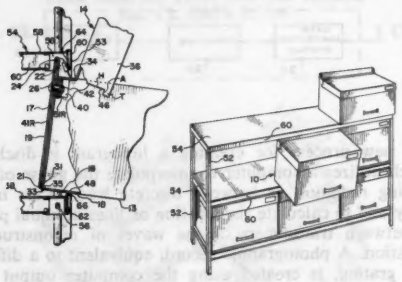
Modular furniture composed of separately formed parts including a skeleton chassis, supporting legs, and ornamental side and top panels which may be assembled to provide a finished article of furniture, such as a table, cabinet, chest, or the like. The furniture parts are preferably injection molded or heat formed from plastic and are constructed and arranged in such a way that different leg and panel configurations may be assembled on a given chassis configuration to provide a variety of furniture styles all using the same basic chassis configuration.

3,606,511
TACKLE BOX
James L. Henning, Aurora, and Robert E. Pierson, Sugar Grove, Ill., assignors to Plano Molding Company, Plano, Ill.
Filed Aug. 3, 1970, Ser. No. 62,226
Int. Cl. A47b *51/00*
U.S. Cl. 312—266 9 Claims



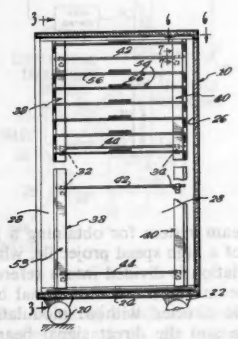
Tackle box includes a plurality of storage drawers guidingly supported for selective horizontal movement by trays which are cantilevered.

3,606,512
STEEL SHELF DRAWER
Irwin J. Ferdinand, Glencoe, Irwin R. Kulbersh, Morton Grove, and Gerald D. Cassiere, Chicago, Ill., assignors to The Hirsh Company, Skokie, Ill.
Filed Feb. 11, 1970, Ser. No. 10,357
Int. Cl. A47b *88/06*
U.S. Cl. 312—323 16 Claims



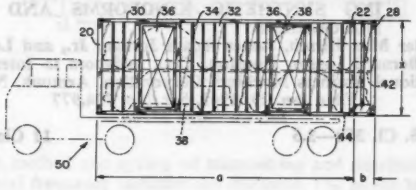
A knockdown, top-opening, hinged-cover, drawer-type receptacle for closed storage of objects between two lightweight steel shelves. An upstanding lip at the rear of the receptacle engages depending shelf flanges along the front and rear of the upper shelf to prevent accidentally moving the unit off of the lower shelf. This interengagement at the front flange also serves to support the receptacle in its access position, preferably tilted to some degree, or lifted out for removal. A cover member, easily assembled and hinged at the rear, cooperates with the upper edge of the receptacle to hold the cover in its fully open position when opened.

3,606,513
ROD TYPE TRAY SLIDE
Carter Clifford Hoffmann, Lake Forest, and Richard R. Berger, Antioch, Ill., assignors to Carter-Hoffmann Corp.
Filed Apr. 23, 1970, Ser. No. 31,193
Int. Cl. A47b *77/00*
U.S. Cl. 312—351 11 Claims



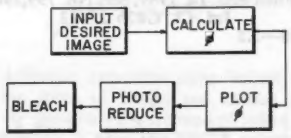
An insulated food serving cart is provided with removable rack assemblies having pivoted tray support members structured in such a way as to positively support vertically spaced trays without the tray support members interfering with the contents of the tray and at the same time allowing for variations in the tray dimensions.

3,606,514
CONTAINER FOR TRANSPORTING VEHICLES
Ronald M. Katims, 10 Clydesdale Road, Scotch Plains, N.J. 07076
Filed June 16, 1969, Ser. No. 833,521
Int. Cl. A47b *97/00*
U.S. Cl. 312—352 8 Claims



A box-like container for transporting vehicles secured therein and capable of being stacked in interlocked, superposed relation with containers of various lengths. Doors have been provided along the container side wall and positioned to correspond with the driver door of each vehicle secured within the container for providing access to and from the vehicles.

3,606,515
METHOD OF MANUFACTURING WAVE SHAPING OBJECTS
Peter M. Hirsch, James A. Jordan, Jr., and Louis B. Lesem, Houston, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 25, 1968, Ser. No. 778,525
Int. Cl. G02b *27/38*
U.S. Cl. 350—3.5 15 Claims



The technique is for arbitrarily altering a physical (e.g., electromagnetic or sound) wavefront, in which the wavefront is shaped by modifying its phase in a controlled manner. A first assumption is made that the image to be formed is of an object made up of point sources with the phases of the rays from each source being random. The random phases assumption permits the second and further assumption that the amplitude of the wavefront, incident on a plane, is constant. Therefore, the wavefront is shaped solely by operating on its phase.

The wavefront scattered from an object is first, in the preferred embodiment, calculated digitally and the calculation is identical to that used to calculate the wavefront as in conventional digital holography when a point aperture object assumption is made. The phase of each point in the wavefront is determined and a plot tape written for a plotter, the phase information scaled from 0 to 2π over the gray levels available, such that a pho-

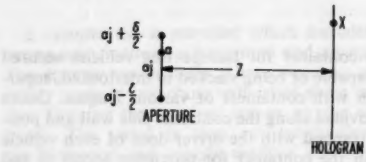
tographic film is produced, the darkening of which over its area is a measure of phase. The thus produced film is then photo-reduced to give a phase distribution at the appropriate wavelength of light. The photo-reduction is then bleached such that the emulsion is of uniform transmissivity but with an etched surface, the etch depth of which is proportional to emulsion darkening. Upon illumination the waves incident upon the photo-reduction are selectively retarded by the thickness differences of the emulsion such that the resultant interference at an image plane produces the desired image.

3,606,516

DISCRETE APERTURE METHOD OF MAKING SYNTHETIC KINOFORMS AND HOLOGRAMS

Peter Max Hirsch, James Adam Jordan, Jr., and Louis Bernard Lesem, Houston, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1969, Ser. No. 794,977
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **11 Claims**



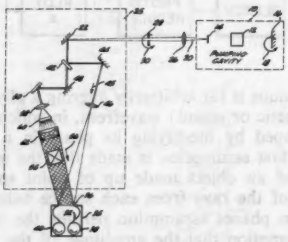
A method of constructing the image of a mathematically defined object which may or may not exist in real form. An assumption is made that the image to be formed is of an object made up of equally spaced point sources with the phases of the rays from each source being random.

3,606,517

HOLOGRAPHIC MOTION PICTURE SYSTEM

Alexander D. Jacobson, Los Angeles, and Viktor Evtuhov, Pacific Palisades, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 14, 1969, Ser. No. 799,290
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **11 Claims**



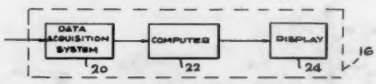
A holographic motion picture system is disclosed for producing a succession of holograms capable of faithfully reproducing the continuous motion of a moving subject. The system includes a continuously pumped ruby laser operated in the repetitive Q switched mode to produce light pulses at a rate of 160 p.p.s. Every eighth pulse is used to produce a hologram of a moving subject on a moving light sensitive film.

3,606,518

WAVEFRONT RECONSTRUCTION PROCESS AND SYSTEM

Alexander F. Metherell, Newport Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed May 14, 1969, Ser. No. 824,399
Int. Cl. G02b *27/22*; **G01s** *9/66*; **G01v** *1/00*
U.S. Cl. 350—3.5 **10 Claims**



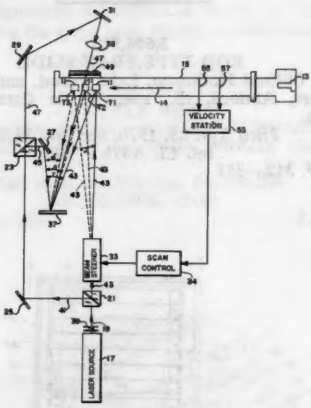
A new process for creating a hologram is disclosed which utilizes a computer to interpolate the phase of impinging radiation as between discrete transducers in an array and to calculate the location of lines of equal phase as between transducers of the waves of reconstructing radiation. A photographic record, equivalent to a diffraction grating, is created using the computer output and the record can be used as a hologram to generate real and virtual images.

3,606,519

MULTIPLE IMAGE STORING SYSTEM FOR HIGH SPEED PROJECTILE HOLOGRAPHY

Robert L. Kurtz, Blacksburg, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

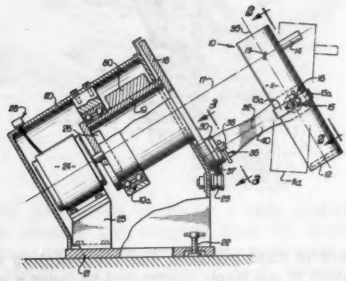
Filed Feb. 2, 1970, Ser. No. 7,867
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **5 Claims**



A three beam system for obtaining a holographic record on film of a high speed projectile, wherein a coherent beam of radiation is divided into a reference beam, a direct signal beam and a reflected signal beam. The reference beam is directed without modulation to a photographic plate and the direct signal beam is directed to the photographic plate after transmission by the projectile. The reflected signal beam is directed into a beam steerer which allows the synchronous tracking of the projectile with the reflected signal beam. On reflection from the projectile the reflected signal beam is incident on the

photographic plate. As the included angle between the reference beam and the reflected signal beam changes, multiple images of the target will be stored in the thick emulsion of the photographic plate.

3,606,520
TRACKING INSTRUMENT MOUNT
Thomas B. Rockwell, 2318 Rockinghorse Road, Miraleste, Calif. 90731
Filed Sept. 30, 1968, Ser. No. 763,633
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 1 Claim

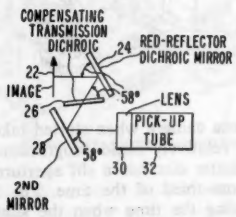


The disclosure concerns a mount for an instrument used in tracking celestial objects, and enabling comfortable sustained viewing by the observer using the instrument, for extended time periods.

ERRATUM

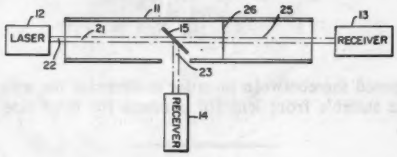
For Class 350—162 see:
Patent No. 3,606,542

3,606,521
APPARATUS FOR COMPENSATING FOR ANGULAR VARIATION OF DICHROIC MIRROR CHARACTERISTICS
Skipwith W. Athey, Portola Valley, Calif., assignor to International Video Corporation, Sunnyvale, Calif.
Filed Mar. 11, 1970, Ser. No. 18,466
Int. Cl. G02b *5/28*
U.S. Cl. 350—166 3 Claims



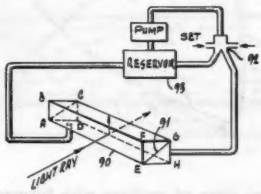
An optical filter including a dichroic transmission filter and a dichroic reflecting mirror, the transmission filter having substantially the same light-passing characteristics so that as the angle of incidence between a beam and the reflecting mirror is varied, variation in the reflection characteristics of the optical system is substantially reduced.

3,606,522
OPTICAL FREQUENCY WAVEGUIDE AND TRANSMISSION SYSTEM
Charles H. Townes, Cambridge, Raymond Y. Chiao, Boston, and Elsa M. Garmire, Cambridge, Mass., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Original application Oct. 11, 1965, Ser. No. 494,739, now Patent No. 3,556,634, dated Jan. 19, 1971. Divided and this application Jan. 24, 1969, Ser. No. 822,089
Int. Cl. G02b *5/14, 27/14*
U.S. Cl. 350—171 10 Claims



A method and system of transmitting and distributing optical frequency radiation are disclosed. The power level of the radiation beam is maintained at a level which is a function of the pressure and dielectric constant of a gas through which the beam is transmitted. The beam through the gas generates its own waveguide to prevent beam divergence through the gas.

3,606,523
FLUID VARIABLE LIGHT DEFLECTOR
George William Taylor, Princeton, and Philip Goldstein, North Brunswick, N.J., assignors to RCA Corporation
Filed May 14, 1968, Ser. No. 728,957
Int. Cl. G02b *1/06, 3/12;* G06m *1/12*
U.S. Cl. 350—179 6 Claims

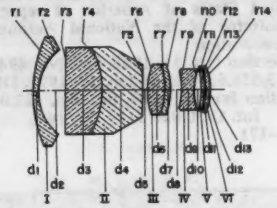


A light deflection apparatus using hollow optical elements in the form of lenses and prisms and means for selectively introducing differing refractive index fluid into the elements to alter the optical properties of the elements. A further apparatus embodiment uses a longitudinally divided prism for changing the prism exit direction of a transitory light beam by selectively creating total reflection at an interface within the prism between a permanent transparent medium and a selectively introduced transparent fluid.

3,606,524
INVERTED TELEPHOTO TYPE WIDE-ANGLE LENS SYSTEM
Toshinobu Ogura, Sakai-shi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed May 29, 1969, Ser. No. 829,028
Claims priority, application Japan, June 1, 1968, 43/37,355
Int. Cl. G02b *9/62*
U.S. Cl. 350—215 4 Claims

An inverted telephoto type wide-angle lens system used for a photographic or cinecamera, which is composed of an air spaced 6-group lens comprising seven or eight

lenses, and more particularly an inverted telephoto type wide-angle lens system capable of making a good image, which second lens group is provided with a thick lens

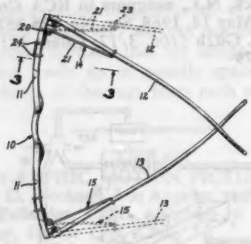


interposed therebetween in order to decrease the aperture of the suitable front lens for cameras for large size pictures.

ERRATUM

For Class 352—91 see:
Patent No. 3,606,529

3,606,525
SPRING FOR EYEGLASS FRAMES
Bert J. Landree, 6009 Ewing St. S., Edina, Minn. 55410
Filed Oct. 24, 1969, Ser. No. 869,113
Int. Cl. G02c *5/16*
U.S. Cl. 351—113 **3 Claims**



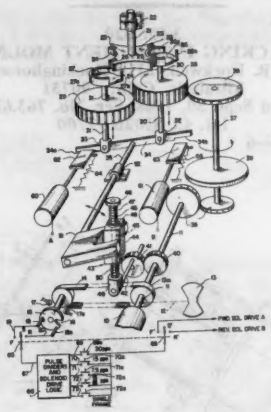
An elongated piece of resilient wire formed into a torsion coil spring with end portions extending outwardly therefrom, the end portions formed to engage the frame to prevent relative transverse movement therebetween while allowing longitudinal movement and biasing the arms of the frame inwardly toward the lens holding portion.

ERRATA

For Classes 352—12 and 352—116 see:
Patent Nos. 3,606,543 and 3,606,544

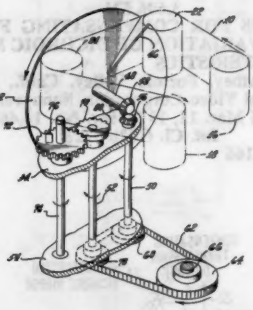
3,606,526
INDEXING DRIVE MECHANISM
Elliott P. Smith, Huntington, Robert P. Mason, Setauket, and William L. Kacin, Northport, N.Y., assignors to LogEtronics Inc., Springfield, Va.
Filed Mar. 13, 1970, Ser. No. 19,232
Int. Cl. G03b *1/38*
U.S. Cl. 352—166 **10 Claims**

An indexing drive mechanism is provided to transport film in a flickerless projection viewer. The indexing mechanism includes a Geneva star and a pair of Geneva drivers positioned adjacent opposed camming surfaces of the star. The two Geneva drivers are mechanically interlocked and synchronously driven for both rotational and axial reciprocating motion relative to the Geneva star, the arrangement being such the drivers normally operate to lock the



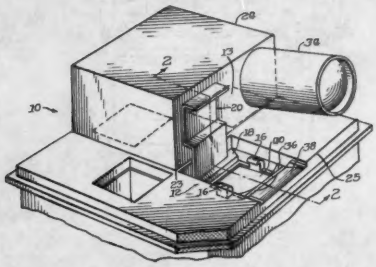
Geneva star in fixed position. The reciprocating motion of the drivers is selectively interrupted to cause a selected one of the drivers to effect 90° rotation of the star in a selected one of two opposite directions.

3,606,527
INTERMITTENT DRIVE FOR SURVEILLANCE CAMERA
Bernard F. McNamee, Arcadia, Calif., assignor to Dressen-Barnes Electronics Corp., Pasadena, Calif.
Filed Feb. 17, 1969, Ser. No. 799,651
Int. Cl. G03b *1/24*
U.S. Cl. 352—190 **6 Claims**



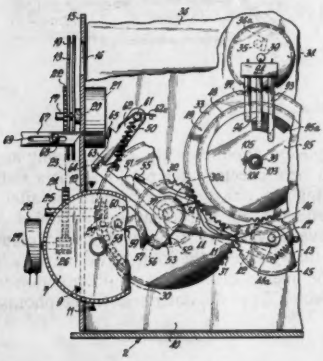
The surveillance camera when started takes a series of still pictures in relatively rapid progression. A continuously rotated shutter disc has a slit aperture in exposure position about one-third of the time. The film sprocket is advanced during the time when the shutter is closed by a simple gear mechanism. The driven gear connected to the sprocket is a complete gear and the driving gear synchronized with the shutter is a mutilated gear. A simple yielding mounting for the mutilated driving gear constitutes the sole means for ensuring proper meshing of the gears. A belt transmission between the sprocket and the takeup spool ensures against the imposition of any tension on the film during exposure that might cause a blurred image.

3,606,528
PRE-VIEWING STATION
Carl C. Costanza, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 23, 1969, Ser. No. 860,385
Int. Cl. G03b *21/00*
U.S. Cl. 353—21 8 Claims



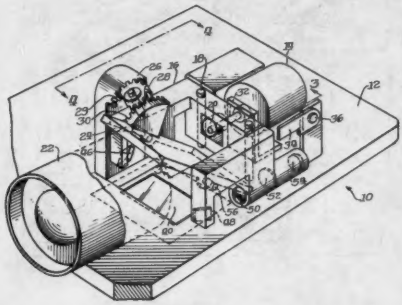
A novel pre-viewing station in a slide projector that facilitates removal and insertion from the station. The slides when present at the pre-viewing station are oriented in a horizontal plane and viewed from the normal operating position are in the same orientation as when projected.

3,606,529
MOTION PICTURE CAMERA WITH DISSOLVING SHUTTER
Herbert Reinsch, Kongen, and Albert Schnell, Stuttgart, Germany, assignors to Robert Bosch Elektronik und Photokino GmbH, Berlin and Stuttgart, Germany
Filed Sept. 8, 1969, Ser. No. 855,885
Claims priority, application Germany, Sept. 11, 1968, P 17 97 312.5
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 19 Claims



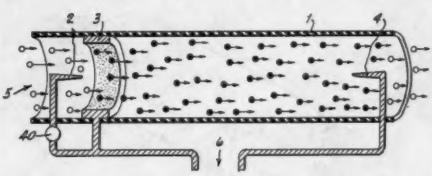
The knob which adjusts the dissolving shutter of a motion picture camera during fade-out and fade-in serves to start the timer mechanism which automatically terminates the fade-out and to prevent rotation of the take-up reel in the film-containing cassette in response to starting of a fade-out effect. The film which is exposed during fade-out is looped in the cassette and is thereupon transported rearwardly prior to fade-in.

3,606,530
FOCUS MAINTAINING DEVICE
Edward J. Hennessy, Hoffman Estates, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 23, 1969, Ser. No. 860,858
Int. Cl. G03b *3/12*
U.S. Cl. 353—101 3 Claims



A focus maintaining film projector that maintains focus by altering the position of a reflecting surface in a folded projection system.

3,606,531
IMAGE REPRODUCTION USING ELECTROGASDYNAMICS
Meredith C. Gourdine, West Orange, N.J., assignor to Gourdine Systems, Inc.
Filed Sept. 30, 1968, Ser. No. 763,854
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 10 Claims

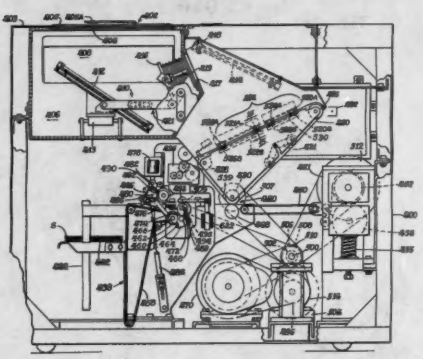


A method and means for reproducing an image on a dielectric sheet, or irregular or curved surface, comprising the use of an electrogasdynamically produced space charge cloud of ionized ink to develop an image of a light pattern projected onto a conventional xerographic plate. The developed ink image is of improved quality by virtue of the tendency of electrogasdynamically produced particles to achieve a uniform charge distribution on a dielectric surface.

3,606,532
PHOTOELECTROSTATIC DUPLICATOR
Loren E. Shelffo, Palatine, Henry A. Mathisen, Northbrook, and Frank L. Schwager, Mount Prospect, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Filed Jan. 21, 1969, Ser. No. 762,617
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 42 Claims

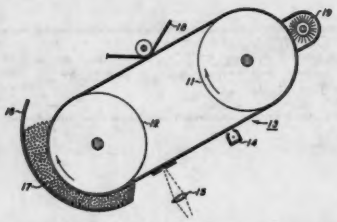
An automatic photoelectrostatic copier duplicator capable of making reproductions on plain paper using electrostatic printing techniques. The apparatus is equipped with a photoconductive medium formed into a continuous belt which carries a transferable powder image and which

image is transferred to a receiving sheet of plain paper fed from a supply to a transfer station in timed relation with the arrival thereat of the transferable powder image.



The belt is provided with a marker which is recognized by sensing devices which are part of an electrical control system.

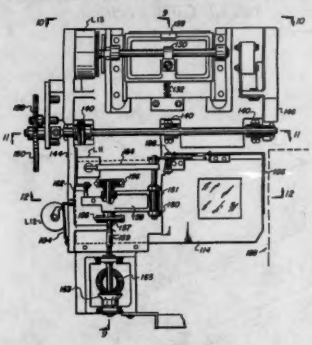
3,606,533
XEROGRAPHIC DEVELOPMENT
Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Original application Feb. 21, 1966, Ser. No. 528,846, now Patent No. 3,503,776, dated Mar. 31, 1970. Divided and this application July 2, 1969, Ser. No. 870,834
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **5 Claims**



Images are formed on an arcuate imaging surface bearing an electrostatic latent image by transporting the imaging surface in a generally ascending arcuate path in a contact zone with a bath of developer material supported in a concave chamber adjacent to the lower face of the imaging surface, the contact zone extending upwardly from about the lowermost point of the arcuate path to a point sufficient to allow frictional contact between the developer and imaging surface along the contact zone to circulate the developer in the bath.

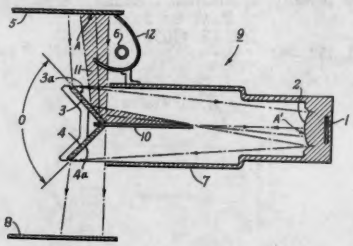
3,606,534
MULTIPLE SIZE RECORDING APPARATUS
Lawrence C. Alman, Jr., and Jack R. Hauber, Webster, and Frank R. Hynes, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed May 14, 1969, Ser. No. 824,539
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 **4 Claims**

An improved xerographic copying/duplicating system arranged in conjunction with an improved aperture card handling and scan system and sheet feed apparatus which are controlled by an improved control circuit and drive system such that high quality copies of film images of varied size are reproduced on copy sheet of varied corresponding size or the same sheet size. Cut sheets are fed



from the sheet feed apparatus in response to control signals to correspond with image size. Also control signals are operative to enable a preselected sheet size irrespective of the image size.

3,606,535
DEVICE FOR RECTIFYING UNEVEN DISTRIBUTION OF ILLUMINATION INTENSITY IN A SLIT EXPOSURE MECHANISM
Yutaka Koizumi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Feb. 14, 1969, Ser. No. 799,435
Claims priority, application Japan, Feb. 17, 1968, 43/11,519
Int. Cl. G03b *27/70*
U.S. Cl. 355—66 **1 Claim**

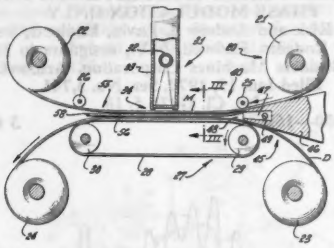


A slit exposure photo-copying device having an optical system with two reflecting mirrors joined at a right angle for projecting an image along a path parallel to the parallel planes of the document to be copied and the photosensitive surface. A contoured shield plate is inserted into the system at the joint of the mirrors in order to rectify the uneven distribution of illumination intensity of light reflected from the document to the photosensitive surface.

3,606,536
APPARATUS FOR CONTACT PRINTING
Robert Beispel, Westlake Village, Calif., assignor to Extek Microsystems, Inc., Van Nuys, Calif.
Filed Sept. 11, 1969, Ser. No. 857,173
Int. Cl. G03b *27/20*
U.S. Cl. 355—91 **8 Claims**

An apparatus for contact printing from an image-bearing master to duplicate or work stock in which the master and duplicate stock are continuously moved through an exposure zone which includes a light source and a device for maintaining the master and duplicate stock in registry

during exposure including an entrance vacuum device. In one embodiment, the registry device includes elongated members disposed between the marginal edges of the master and duplicate stock so as to define longitudinally extending spaces which are in fluid communication with the entrance vacuum device so as to evacuate the spaces by withdrawing air therefrom along longitudinal paths so as to effect atmospheric compression of the master and duplicate stock to prevent relative movement therebetween. The elongated members for separating the marginal edges of the master and duplicate stock may be



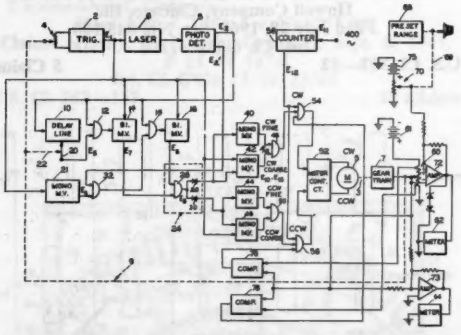
movable or stationary. The entrance vacuum device may comprise a vacuum region for evacuating the air between the master and duplicate as they are guided together along a gradually converging path. The vacuum region may be provided through wedge-shaped device disposed at the entry end of the exposure zone and between the master and duplicate stock or through rollers in non-sliding contact along a continuous line between a pair of sidewalls which define a converging vacuum space or region from which the air is withdrawn to effect initial compression and registry of the master and duplicate stock.

3,606,537

LASER RANGING SYSTEM USING MAGNETOSTRICTIVE DELAY LINE

John F. Yurasek, Passaic, and Arthur Simon, Fair Lawn, N.J., assignors to The Bendix Corporation

Filed Dec. 9, 1968, Ser. No. 782,378
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **5 Claims**



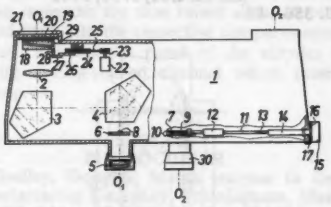
A system using a magnetostrictive delay line for converting the interval between pulses corresponding to the firing of a laser beam at a target and corresponding rebound pulses into a target range indication. The interval between the laser firing and rebound pulses is compared to the delay line interval and a motor is driven in response to the difference between the intervals for automatically tracking the target. A position sensor connected to the motor shaft senses target range information for providing a continuous target range display.

3,606,538

STEREOSCOPIC VIEWING SYSTEM

Siegfried Hesse, Jena, Germany, assignor to VEB Carl Zeiss, Jena, Germany

Filed Apr. 25, 1969, Ser. No. 819,498
Int. Cl. G01c *3/14*
U.S. Cl. 356—12 **3 Claims**



A system for stereoscopic observation of a pair of images of an object includes at least one stereoscopic mark. Accuracy of stereoscopic measurement is increased by periodical relative motion of the object or the pair of images on the one hand and the stereoscopic mark on the other. The frequency f and the amplitude A of the relative motion are respectively 10 min.$^{-1} \leq f \leq 50$ min.$^{-1}$ and

$$1\frac{\Delta w}{\Gamma} \leq A \leq \frac{\Delta w}{\Gamma}$$

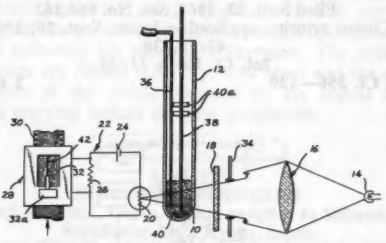
Δw being the mean width revolving power of the human eye; and Γ, the angular manification of the observation system.

3,606,539

APPARATUS AND METHOD FOR MEASURING OSMOTIC FRAGILITY OF RED BLOOD CELLS

Michael L. Polanyi, Webster, Mass., and Henry Lustig, Poughkeepsie, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 13, 1968, Ser. No. 775,465
Int. Cl. G01n *21/06, 21/26, 33/16*
U.S. Cl. 356—39 **9 Claims**

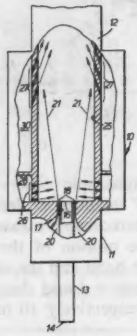


Measuring osmotic fragility of erythrocytes for diagnosis of blood dyscrasias. A blood sample, diluted in an isotonic saline solution, is placed in a test tube which in turn, is positioned in apparatus for measuring osmotic fragility of erythrocytes in the sample. In the apparatus, distilled water is delivered directly into the sample at a predetermined constant rate with continuous mixing to maintain equilibrium of tonicity throughout the sample. The sample is transilluminated during such dilution and light transmittance through the sample is photoelectrically measured and recorded to indicate the rate and percent of hemolysis versus time or tonicity. Tonicities of the sample at which hemolysis starts, ends and/or reaches other values are determined from the recording for interpretation of erythrocytic osmotic fragility.

3,606,540
ANALYSIS OF MOLTEN MATERIALS

Royson Vaughan Williams, Staines, Bruce Bennett Fulford, Harrow, and Edmund Arthur du Bois, Purley, England, assignors to The British Iron and Steel Research Association

Filed Sept. 29, 1969, Ser. No. 861,929
Claims priority, application Great Britain, May 23, 1969, 26,554/69
Int. Cl. G01j *3/30, 3/42*
U.S. Cl. 356—86 **9 Claims**

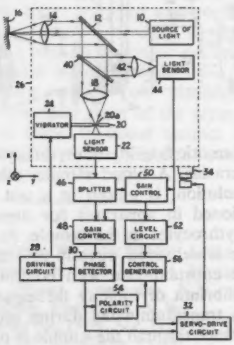


This invention concerns molten material analysis apparatus in which there is means for reducing or preventing build up of particulate material sample on the wall of a conduit carrying said sample from an atomizer which extracts the sample from a melt towards an analysis station. The invention also concerns plasma jet apparatus for analysing a particulate sample which apparatus has means for preventing sample build up between the delivery end of a conduit feeding the sample to the apparatus and a proximate electrode of the apparatus.

3,606,541
CONTACT-LESS PROBE SYSTEM

Tutomu Sugano and Makoto Kikuchi, Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Sept. 23, 1969, Ser. No. 860,263
Claims priority, application Japan, Sept. 28, 1968, 43/70,538
Int. Cl. G01b *11/30*
U.S. Cl. 356—120 **2 Claims**

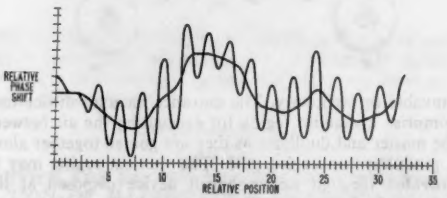


A collimated light reflected from an object is passed through a vibrating pinhole and converted into an AC and a DC component controlled in gain with the light intensity. The polarity of the AC component is phase detected and cooperates with the level of the DC component to determine if the system is within its operative region. When the system is outside the operative region, the phase detected component and the DC level cause the system to enter the operative region. When in its operative region, the system controlled by the phase detected component is maintained in a predetermined position.

3,606,542
COMPLEX-VALUED SPATIAL FILTER USING PHASE MODULATION ONLY

Joseph P. Kirk and Andrew J. Lavin, Endicott, and William C. Rodgers, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,741
Int. Cl. G02b *5/18*
U.S. Cl. 350—162SF **3 Claims**

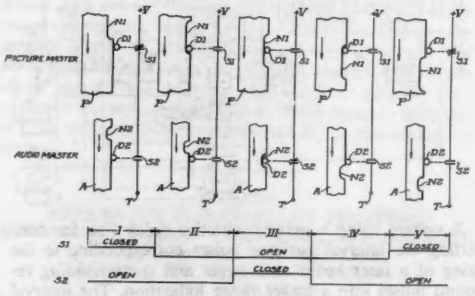


An improved optical spatial filter to produce a transform (image) representing phase and amplitude modulation of the incident wave. The filter is non-absorptive and achieves amplitude modulation of the desired image in a selected diffraction order by diffracting the unwanted light into non-selected orders. The filter is fabricated using only phase filter techniques. Other applications for the filter include conversion of a wave emanating from a given object into a wave representing a given image. Either a transmitted or reflected wave can be used to construct the image.

3,606,543
OUT-OF-SYNC DETECTOR FOR FILM PRINTERS

Andrew Balint, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

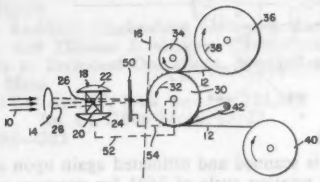
Filed July 28, 1969, Ser. No. 845,168
Int. Cl. G03b *31/04*
U.S. Cl. 352—12 **5 Claims**



An out-of-sync detector for film printers wherein film copies are made by continuous printing from closed loop picture and audio masters. Indicia are located on each master loop and are sensed by detectors. The detectors

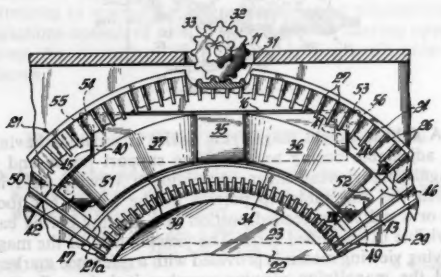
control the opening and closing of serially connected switches. As long as the two master loops move in synchronism, the switches close at different times, however, if the two master loops drop out-of-sync, both switches are closed at the same time and complete a circuit that shuts down the operation of the printer.

3,606,544
REFRACTIVE SHUTTER FOR ROTATING PRISM CAMERAS
Joseph H. Arndt, Boulder, Colo., assignor to TRW Inc., Redondo Beach, Calif.
Continuation of application Ser. No. 550,327, May 16, 1966. This application Aug. 18, 1969, Ser. No. 866,444
Int. Cl. G03b *41/06, 41/08*
U.S. Cl. 352—116 **3 Claims**



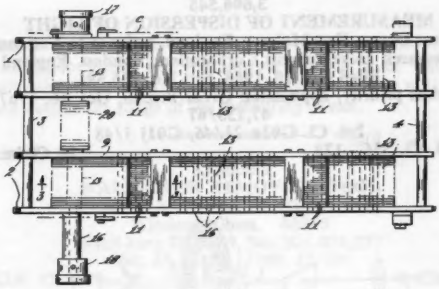
A rotating prism is used as a shutter to intermittently transmit light to film that is moved in timed relation with the rotating prism shutter. The prism shutter contains an interface between two media of different index of refraction. The interface orientation and the index of refraction to pass light are adjusted such that desirable light passing through the prism will meet the interface at an angle of incidence which is less than the critical angle, and, hence, will pass through the interface. Unwanted light will be incident to the interface at an angle greater than the critical angle and, hence, will be totally reflected and not pass through the interface.

3,606,545
CONVERTIBLE SLIDE PROJECTOR
Rolf Heinzmann Stuttgart-Bad Cannstatt and Albert Stieringer, Calmbach, Germany, assignors to Robert Bosch Elektronic und Photokino GmbH, Stuttgart-Unterturkheim, Germany
Filed Sept. 5, 1968, Ser. No. 757,647
Claims priority, application Germany, Sept. 8, 1967, P 15 72 587.8
Int. Cl. G03b *23/04, 23/06*
U.S. Cl. 353—117 **10 Claims**



A convertible slide projector which can operate with circular or straight slide trays has a lifting unit which is composed of two ramps each adapted to lift slides in one type of trays. The lifting unit can be inserted into the bottom wall of the projector housing in either one of two positions in each of which one of the ramps extends upwardly and into a channel provided in the bottom panel of the corresponding type of tray. A straight slide tray is formed with a straight channel and co-operates with a straight ramp which serves to lift those slides which reach the slide changing station to a level above a lateral ledge of the straight tray so that the slide changer can transport the thus raised slides to projection position and back into the respective compartments of the straight tray. The bottom panel of the circular tray is formed with a ring-shaped channel which receives an arcuate ramp.

3,606,546
PHOTOCOPIER
John S. Dudley, Douglas, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed May 13, 1969, Ser. No. 824,100
Int. Cl. G03b *27/62*
U.S. Cl. 355—40 **7 Claims**

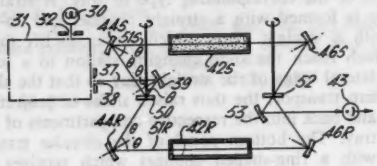


A photocopier for simultaneously copying printed matter and indicia side by side to make articles such as piece-rate tags having severable sections corresponding to the operations performed by successive operators, each section indicating the nature of the operation and the characteristics of the article operated on, each operator tearing off the section corresponding to his operations for use in collecting his piece-work payments. The different operations are copied from a printed sheet and the characteristics of the article operated on are copied from wheels carrying indicia on their peripheries.

3,606,547
SPECTROPHOTOMETER
Kenji Iwahashi, Osaka, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan
Filed Dec. 22, 1969, Ser. No. 887,390
Claims priority, application Japan, Dec. 31, 1968, 44/731
Int. Cl. G01j *3/08, 3/42*
U.S. Cl. 356—97 **1 Claim**

A spectrophotometer which includes an optical system arranged between the exit slit of a monochromator and the sample cell so that the meridional and sagittal image planes of the optical system are axially displaced from each other, thereby causing the bundle of monochromatic light rays to have a well defined, very thin and substantially equal cross sectional area for a long distance along the optical axis of the system. Within this distance the sample cell is placed so that the cell can be made longer than the cells used in the prior art spectrophotometers, with the cross sectional area of the bundle of monochromatic light rays passing through the sample in the cell

substantially corresponding to the cross sectional area of the sample through the whole length of the cell. This ensures efficient and accurate measurement of samples, especially those of relatively low concentrations.



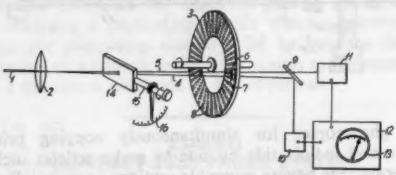
ERRATUM

For Class 356—103 see:
Patent No. 3,606,564

3,606,548
MEASUREMENT OF DISPERSION OF LIGHT

James Dyson, East Molesey, England, assignor to National Research Development Corporation, London, England

Filed Oct. 10, 1968, Ser. No. 766,591
Claims priority, application Great Britain, Oct. 16, 1967, 47,133/67
Int. Cl. G01n *21/46;* G01j *3/48*
U.S. Cl. 356—128 10 Claims



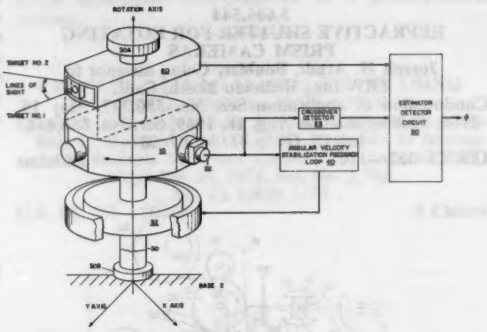
An apparatus for measuring the dispersion of light during its passage through the atmosphere in which a ray of light is modulated by a rotating chopper. Light of differing wave-lengths in the ray is chopped at different instants due to the lateral displacement of images of the source of the ray formed by light of differing wavelengths resulting from dispersion of the light by the atmosphere. The phase difference of the modulations for two colours, which is related to the dispersion, is measured.

3,606,549
RING LASER INERTIAL ANGLE ENCODER

Joseph D. Coccoli, Brighton, and John R. Lawson, Lincoln, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 14, 1969, Ser. No. 815,786
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 10 Claims

A ring laser angle encoder which measures the angular difference in inertial positions of two targets and provides a highly accurate, continuous, digital readout thereof. The encoder comprises a rotatable ring laser maintained at a constant inertial angular rotation rate above a predetermined threshold value such as to generate a digital count directly proportional to the angle through which the laser has rotated; a scanner-photometer rigidly affixed to the laser and rotatable therewith about the laser's rotation axis, which converts the light intensity of each target scanned into an electrical signal having a frequency proportional thereto; and an estimator-detector circuit coupled to the output of the ring laser and the photometer, which estimates the center of each target scanned and records the laser's digital count (and fraction thereof) existing when each target center is scanned. The first target

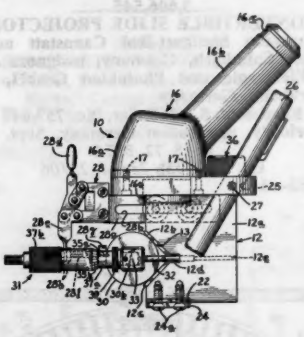


scanned is scanned and estimated again upon completion of a full rotation cycle of 360° for purposes of self-calibration. The resulting digital counts for the aforementioned three detections are combined to provide a digital output from the estimator-detector circuit which is a highly accurate indication of the angular difference between the two targets of interest.

3,606,550
METHOD AND APPARATUS FOR SETTING THE POSITION OF A BORE CUTTING TOOL

Arthur J. Proksa, Elmwood Park, Ill., assignor to Everede Tool Company, Chicago, Ill.

Filed Apr. 21, 1969, Ser. No. 817,976
Int. Cl. B27g *23/00*
U.S. Cl. 356—171 13 Claims



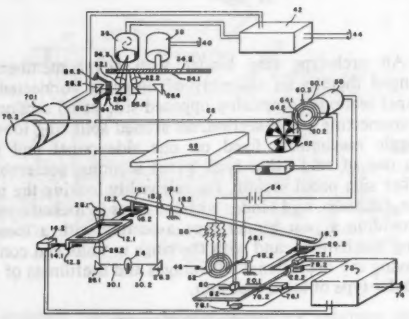
A light-in-weight magnifying device is provided having an adjustable boring bar receiving support frame and a magnifying viewing means providing a viewing field in which the adjustable tip portion of the boring bar tool bit or a radially extended portion of a dummy boring bar is visible in magnified form. The viewing field of the magnifying viewing means is provided with a reference marker, and the magnifying viewing member includes adjusting means for adjusting the relative position of the support frame and the viewing means so that the tip portion of the magnified image within the viewing field can be adjusted relative to said reference marker thus providing an indication of the exact radial extent from the axis of

the boring bar or the dummy boring bar. The dummy boring bar carries a micrometer unit attached thereto, the micrometer unit having a radially extending member adjustable in position in precisely measurable amounts from the axis of the dummy boring bar body thus providing means for setting an initial radius dimension which is set up in the viewing field of the magnifying viewing means by adjusting the support frame so the top of the radially extending member of the micrometer unit is in registry with the reference marker. The magnifying device is then placed over the boring bar mounted on the head of a machine tool and the tool bit is adjusted to bring the tip thereof in registry with the reference marker.

3,606,551
OPTICAL FILTERING METHODS AND STRUCTURES FOR INCREMENTAL SCANNING SYSTEMS

Richard J. Becherer, Chelmsford, George B. Parrent, Jr., Carlisle, and Thomas J. Skinner, Chelmsford, Mass., assignors to Technical Operations, Incorporated, Burlington, Mass.

Filed Apr. 15, 1968, Ser. No. 721,472
Int. Cl. G01n *21/06, 21/22*
U.S. Cl. 356—203 **6 Claims**



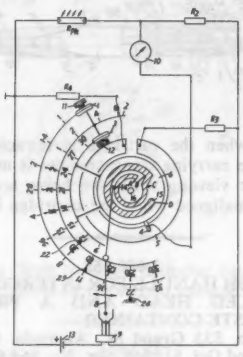
This disclosure depicts a method for producing isophote records from a photographic transparency record or the like. The disclosure further depicts novel apparatus for assisting in practicing the described method, comprising a microdensitometer for optically scanning a specimen carrying information in terms of density differences combined with a write-out device responsive to the microdensitometer for forming an isophote record characterizing the density variations in the scanned specimen. The disclosure emphasizes linear filtering methods and structures for use in microdensitometry with particular attention to scanning aperture filters having transmittance functions optimized to accomplish desired filtering operations. An exemplary filter for suppressing grain noise is shown.

3,606,552
PHOTOGRAPHIC EXPOSURE MEASURING DEVICE

Dieter Ambrosius, Dresden, Germany, assignor to Kombinat Veb Pentacon Dresden Kamera- und Kinowerke, Dresden, Germany

Filed Mar. 12. 1969, Ser. No. 806,651
Int. Cl. G01j *9/42*
U.S. Cl. 356—227 **6 Claims**

A photo-electric exposure measuring device includes in a housing an exposed measuring circuit having an indicating device connected with a photo sensitive device influenced by prevailing light conditions. A plurality of exposure factor setting devices influence a summation element rotatably mounted on the housing which summation element influences the indication of the indicating device. The summation element is provided with guide means engageable by a lever for operating a switch. In use, the measuring circuit is connected to a source of supply po-



tential via the switch. The switch is operative via the lever and guide means and disconnects the source of supply potential when the combination of exposure factor settings are outside the range of the measuring device.

3,606,553
WALLPAPER REMOVING TOOL

Concetta M. Petrus, 45 Midian Ave., Windsor, Conn. 06095

Filed June 25, 1969, Ser. No. 836,337
Int. Cl. A46b *11/00, 17/08*
U.S. Cl. 401—39 **1 Claim**

A tool for aiding in the removal of wallpaper. The tool has a hollow, elongated container adapted to be filled with a fluid for loosening wallpaper from a wall. The container has a funnel for directing the fluid onto a roller detachably mounted on pivot arms connected to the funnel. The funnel furthermore has a channel in the outer portion thereof for supporting a perforated plate for permitting passage of fluid from the hollow container to the roller when the roller is positioned adjacent the perforated plate and also for supporting a scraper plate when the roller is removed.

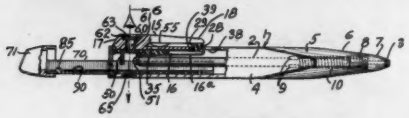
3,606,554
BALL-POINT PEN

Jorgen O. de Bang, P.O. Box 4605, Nassau, Bahamas, and Henrik J. Rolighed, Vedskolle, pr. Vallo, Denmark

Filed July 7, 1969, Ser. No. 847,485
Int. Cl. B43k *7/12, 29/12*
U.S. Cl. 401—105 **4 Claims**

The device includes a cartridge having a ball-point and axially positioned within a barrel. Inner and outer clips, connected together are movable internally and externally

of the barrel. The inner clip engages the inner end of the cartridge to move it when the outer clip is moved. Locking means holds the inner clip in position under control of the outer clip. Both clips and the barrel have bores



which align when the cartridge is retracted within the barrel. A slide carrying transparencies is movable within the barrel for viewing when the bores are aligned, the bores being unaligned when the cartridge is extended.

3,606,555

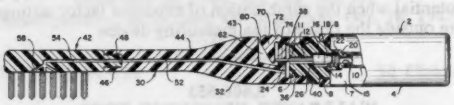
TOOTHBRUSH HANDLE FOR INTERCONNECTING A BRISTLED HEAD AND A PRESSURIZED TOOTHPASTE CONTAINER

Tomaso Ferro, 533 Grand St., Alameda, Calif. 94501

Filed Oct. 8, 1969, Ser. No. 864,642

Int. Cl. A46b *5/02, 11/02*

U.S. Cl. 401—190 **7 Claims**



A toothbrush handle for connecting a pressurized container of toothpaste with a bristled toothbrush head, and comprising an elongated, hand-holdable component provided with a longitudinally extending supply passage and a valve control eleemnt. The supply passage communicates adjacent one end with the discharge port of the pressurized toothpaste container and adjacent the other end with a paste distribution passage in the brushing head. The valve control element is operatively connected with and controls a paste discharge valve on the pressurized container so as to permit selective delivery of paste to the brushing head.

3,606,556

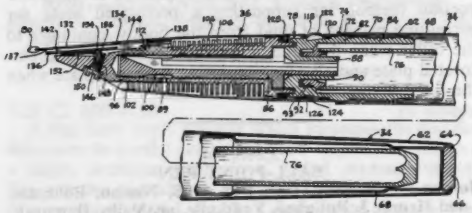
FOUNTAIN PEN

Homer T. Green, Milton, and Frederick R. Wittnebert, Whitewater, Wis., assignors to The Parker Pen Company, Janesville, Wis.

Filed Apr. 29, 1970, Ser. No. 32,868

Int. Cl. B43k *1/02*

U.S. Cl. 401—231 **22 Claims**



A fountain pen having an integral nibbed-point and shell portion providing greater collector capacity; a clutch ring having elements adapted to extend through openings in the integral portion for firmly attaching the portion to internal pen structures and for frictionally resisting movement of a cap assembly when said cap is covering the point end of the pen; adjustable members exert, a force on tines comprising the nib to vary their separation for regulating variations in line breadth resulting from use of the pen.

3,606,557

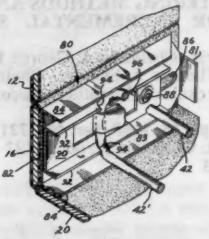
ARCHED RING-WIRE POST BINDER

Frank Stanley Schade, Holyoke, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.

Continuation-in-part of application Ser. No. 699,906, Jan. 23, 1968. This application Dec. 3, 1968, Ser. No. 784,533

Int. Cl. B42f *3/02*

U.S. Cl. 402—31 **3 Claims**



An arch-type ring binder with cover members and hinged thereto an assembly of hingedly connected back panel sections comprising opposed side panel sections and a connecting panel section, an arched split ring loose leaf toggle mechanism fixed on one side panel and means on one of said other back panel sections, preferably the other side panel section, for releasably locking the arched rings thereto, said binder with the rings in locked condition providing a post binder type assembly with a loose leaf ring mechanism, and with the rings in unlocked condition having the operational advantages and usefulness of a ring binder type of loose leaf unit.

3,606,558

SUPPORT FOR PORTABLE DRILLING MACHINES OR THE LIKE

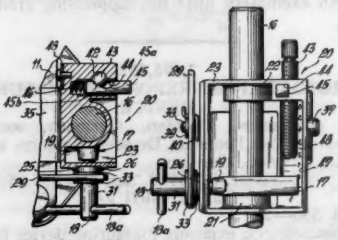
Herbert Dieterle, Scharnhausen, Alfred Hettich, Echterdingen, Kurt Paule, Stuttgart-Heumaden, Eberhard Vogel, Schonaich, and Max Burklin, Waldenbuch, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 17, 1969, Ser. No. 842,463

Claims priority, application Germany, July 24, 1968, P 17 52 837.9

Int. Cl. B23b *45/14, 49/00*

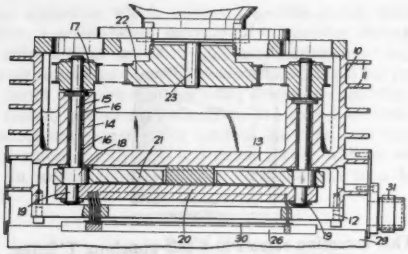
U.S. Cl. 408—16 **9 Claims**



A support for portable drilling machines comprises a column extending upwardly from a work supporting base, a clamp movable along the column, an arm movable along the column with reference to the clamp and having

means for holding a drilling machine so that the tip of the drilling tool extends toward the base, and a feed depth selecting device including an externally threaded gage in a vertical bore of the arm and a locking bolt having threads which normally mate with the threads of the gage. The bolt can be disengaged from the gage in response to application of finger pressure and the gage abuts against the clamp when the arm moves the machine to the lowermost position in which a workpiece mounted on the base is formed with a hole of desired depth. A scale on the arm cooperates with an index on the clamp to indicate the position of the arm with reference to the clamp.

3,606,559
MULTIPLE SPINDLE HEADS FOR DRILLING AND LIKE MACHINES
Clifford Kingsbury Fitch, Ditchling, Sussex, and David Henry Hemming, Loughton, England, assignors to Kingsbury Fitch (Developments) Limited, London, England
Filed July 8, 1969, Ser. No. 839,903
Claims priority, application Great Britain, May 7, 1969, 23,387/69
Int. Cl. B23b *39/16*
U.S. Cl. 408—53 **9 Claims**

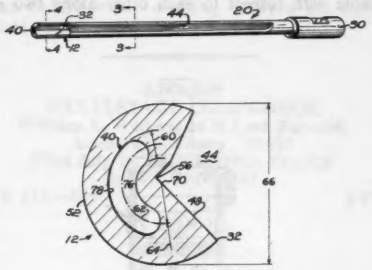


A multiple spindle head for a drilling machine comprises a carrier, a plurality of spindles rotatable in bearings in the carrier, each spindle having an eccentric crank pin and the crank pins engaging a drive member capable of gyratory movement relatively to the carrier and about an axis parallel to the axes of the spindles, in such a manner as to rotate the spindles. Each crank pin is coupled to the spindle by a crank portion the axis of which is inclined at an angle θ of less than 90° to the axis of the spindle, and the spacing of at least some of the spindles is such that the crank portions of adjacent spindles are interleaved.

The drive member is rotationally balanced by a balancing member arranged to gyrate 180° out of phase with the drive member, the two members having bearing surfaces one of which engages and rolls around the other, in epicyclic fashion, as the two members gyrate.

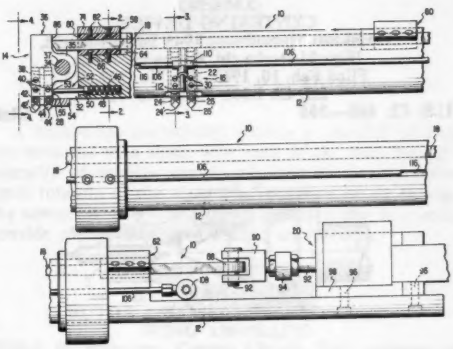
3,606,560
DRILL
Morton McClennan, 17259 Chillicothe Road, Chagrin Falls, Ohio 44022
Continuation of application Ser. No. 729,232, May 15, 1968. This application July 1, 1970, Ser. No. 56,101
Int. Cl. B23b *51/06*
U.S. Cl. 408—59 **4 Claims**

An improved drill includes a body having a first passage therethrough for conducting fluid and an extruded tungsten carbide cutting tip having a second passage therethrough forming a continuation of the first passage. The second passage has a cross-sectional area which is no greater than the cross-sectional area of the first passage and which is more than one and a half times as great as



the area of a circle having a diameter equal to the width of the cross section of the second passage.

3,606,561
SWIVEL HEAD BORING BAR
John D. Davis, Ellettsville, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Mar. 12, 1970, Ser. No. 18,968
Int. Cl. B23b *29/034*
U.S. Cl. 408—146 **7 Claims**

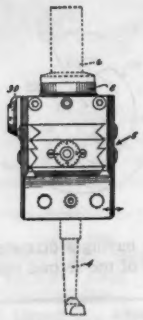


An axially movable boring bar carries a plurality of radially directed tools at longitudinally spaced position with one of the tools being adjustably positioned about a pivot axis perpendicular to shaft axis to reduce the overall travel of the boring bar.

3,606,562
OFFSET BORING HEAD
Marvin Wills, 2630 E. Willamette Ave., Colorado Springs, Colo. 80909
Filed May 19, 1969, Ser. No. 825,629
Int. Cl. B23b *29/034*
U.S. Cl. 408—181 **4 Claims**

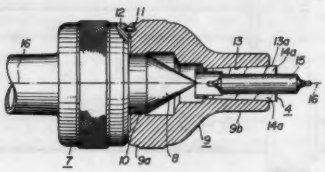
An adjustable precision boring head for machine tools having coarse and fine adjustment means comprising four slidably interconnected elements in stacked relation and wherein the coarse adjustment for lateral movement of the cutting tool comprises screw means for moving the first and second of said elements with respect to each other along a single axis, and where the fine adjustment comprises further means interconnecting the second and third elements wherein they are movable with respect to

each other at an angle of ninety degrees to the direction of longitudinal movement between the first and second elements, and further having means interconnecting the third and fourth elements in such a manner that they are movable with respect to each other along two mutually



perpendicular axes, where, because of the operation of guides, the second and fourth elements are restricted in their relative movement to a direction which is parallel to the direction of relative movement between the first and second of the stacked elements.

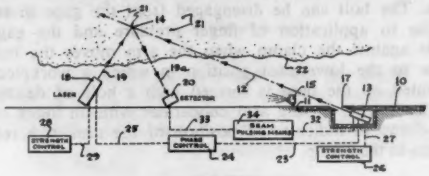
3,606,563
CENTERING DEVICE
Masakazu Matsumoto, 1945 Ishikiri-machi, Higashi-Csaka-shi, Osaka-fu, Japan
Filed Feb. 10, 1969, Ser. No. 797,983
Int. Cl. B23b *49/04, 43/02*
U.S. Cl. 408—200 **1 Claim**



A centering device comprising a rotary center body rotatably mounting a center shaft, and a center drill mounting member removably connected to said rotary center body. The center drill mounting member is formed at one end with a bore for receiving therein said center shaft and mounting a collet at the other end thereof for holding a center drill on the extension of the center axis of said center shaft. This centering device permits to readily and quickly effect connection and disconnection of the center drill to and from the rotary center in effecting centering of a workpiece.

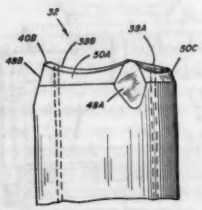
3,606,564
METHOD AND APPARATUS FOR VISIBILITY DETERMINATION AT AIRPORTS
Dennis J. Lisack, Chicago, Ill.
(Box 286 APO, San Francisco, Calif. 96328)
Filed June 5, 1969, Ser. No. 830,658
Int. Cl. G01n *21/00;* **G01b** *9/02*
U.S. Cl. 356—103 **12 Claims**

A beam of coherent light of a given frequency is directed up along the glide path at the approach end of an airport runway. At a first location below the level of said glide path and some distance from said approach end, a second beam of coherent light of said frequency is directed at a point on the glide path so that the second beam will be reflected to a second location by particles in clouds



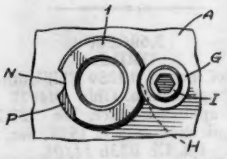
at said point. The beams are so arranged that destructive interference between the two beams at said point occurs when the visibility along said glide path is at least equal to the prescribed minimum.

3,606,565
SELF-PUNCHING T FITTING
Eldon W. Morain and Jerry W. Riggs, Tulsa, Okla., assignors to Continental Industries, Inc., Tulsa, Okla.
Filed June 26, 1969, Ser. No. 836,927
Int. Cl. B23b *41/08, 51/04*
U.S. Cl. 408—204 **6 Claims**



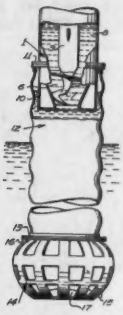
This invention relates to a self-punching T fitting. More particularly, the invention relates to an improved punch face configuration for a punch member as utilized in a self-punching T fitting, the punching member serving to punch a hole in a pipe, such as a gas main, by rotation axial advancement of the punch against the pipe, the improved punch face serving to penetrate the pipe to which the self-punching T fitting is attached and to augment the grasping of the coupon punched out of the pipe so that the coupon is retained and retracted rather than being deposited into the interior of pipe.

3,606,566
BUSHING FOR DRILL JIGS AND THE LIKE
Dale L. Bethke, 2924 Nesa Drive, West Covina, Calif. 91790
Filed June 23, 1969, Ser. No. 835,618
Int. Cl. B23b *49/02*
U.S. Cl. 408—241 **1 Claim**



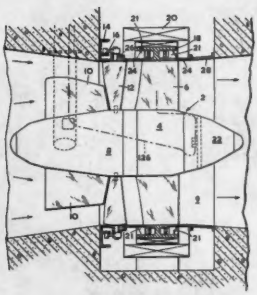
A guiding bushing for drills and reamers and more particularly to an improved form of interchangeable bushing which may be readily replaced to accommodate different sizes of drills in a single location or to provide a means for interchange to accommodate wear. The holding means is optionally arrangeable for either contingency.

3,606,567
TRANSPORTING APPARATUS FOR SOLIDS-LIQUID MIXTURES
Martin Stähle, % Hidrostal, S.A., Avda Argentine 2842, Lima, Peru
Filed Nov. 13, 1969, Ser. No. 876,466
Int. Cl. F01b *25/00*
U.S. Cl. 415—47 9 Claims



An apparatus which utilizes a suction pump designed to pass a solids-liquid mixture with minimal damage to the solids and an extensible tube terminating in a weighted strainer capable of passing solids which will pass the pump; the depth of submergence being variable depending on the suction pressure produced by the pump whereby on encountering excess solids content the tube and strainer raises automatically to a less dense region, and on reduction in solids content, extends automatically to a lower level.

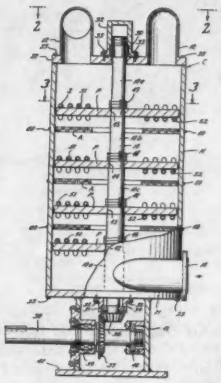
3,606,568
WATER TURBINES AND PUMPS
Michael Braikevitch and Emil Goldwag, Netherton, England, assignors to The English Electric Company Limited, Strand, London, England
Filed Mar. 5, 1969, Ser. No. 804,438
Claims priority, application Great Britain, Mar. 5, 1968, 10,672/68
Int. Cl. F01b *11/08*; B65d *53/00*
U.S. Cl. 415—175 5 Claims



The invention relates to water turbines and pumps.

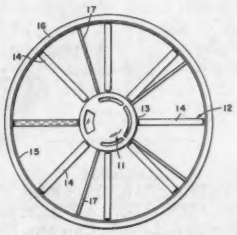
The invention provides a water sealing means for reducing to a low value the escape of water from the water flow duct of such a machine between cooperating stationary and rotating parts thereof. In such sealing means one of the said parts carries a rigid circular sealing surface, and the other carries a flexible compliant circular sealing surface which is automatically controlled at all parts around its circumference to lie closely adjacent but not touching the rigid sealing surface, by two opposing forces provided respectively by a biasing fluid under pressure and by the water escaping between the rigid and compliant sealing surfaces.

3,606,569
MULTI-STAGE COMPRESSOR
William A. Wallace, 2438 Lord Baronof, Anchorage, Alaska 99503
Filed July 15, 1969, Ser. No. 841,928
Int. Cl. F01d *1/02*
U.S. Cl. 415—199 4 Claims



A multi-stage compressor wherein a plurality of disks are mounted on a shaft, with each of the disks having a plurality of tubular scoops, whereby air is compressed upon rotation of the discs by the pulling of air through the scoops in successive stages of compression to thereby provide a simplified low cost air compressor.

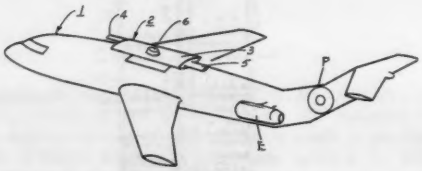
3,606,570
ROTOR ASSEMBLY FOR ROTARY WING AIRCRAFT
Willett H. Haggerty, Corpus Christi, Tex., assignor to The VLM Corporation, Fort Worth, Tex.
Filed Aug. 11, 1969, Ser. No. 848,990
Int. Cl. B64c *27/20*
U.S. Cl. 416—2 11 Claims



A rotary wing, vertical lift aircraft includes a central fuselage and a rotor consisting of an inner annular hub rotatably supported on and encircling the fuselage, radially extending rotor blades, and an outer supporting ring. The rotor is adapted to be driven by a turbine device

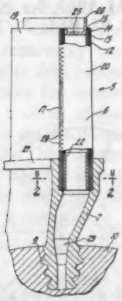
associated with the rotor outer ring and an outer track nonrotatably attached to the fuselage. Each rotor blade is attached to a support member in the hub structure, and the support members are interconnected by tension members designed to separate from the support members under predetermined load whereby the rotor structure will separate fom the body in the event that one rotor blade is lost creating an unbalance in the rotor.

3,606,571
STOWED ROTOR
Reginald T. Wood, 1150 Atlanta Road, Marietta, Ga. 30060
Filed Mar. 7, 1969, Ser. No. 805,166
Claims priority, application Great Britain, Mar. 8, 1968, 11,501/68
Int. Cl. B64c *27/22*
U.S. Cl. 416—87 **4 Claims**



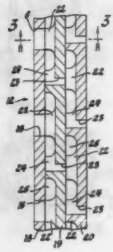
A stowed rotor arrangement is disclosed which is adapted for mounting atop the fuselage of an airplane or the like and comprises a rotatable housing unit mounted on a vertical shaft and provided with telescopically related rotor blade units together with means for extending and retracting the rotor blade units from the housing unit, these units being for the purpose of providing vertical lift for the aircraft so as to facilitate take-off and landing operations.

3,606,572
AIRFOIL WITH POROUS LEADING EDGE
Ronald P. Schwedland, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 25, 1969, Ser. No. 852,555
Int. Cl. F01d *5/08*
U.S. Cl. 416—90 **10 Claims**



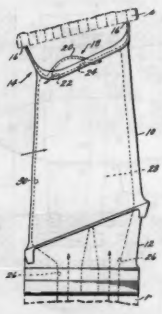
A hollow airfoil for use as a turbine vane or blade is made up of a number of sheet metal layers bonded together and folded at the leading edge. Holes for transpiration cooling of the blade are formed in the leading edge, the holes in the successive layers being disposed in spanwise rows with the holes in each layer partially overlapping the holes in the corresponding row in adjacent layers. These holes improve the folding properties of the leading edge. Some of them are connected to conduct air to the forward portion of the porous side walls of the airfoil.

3,606,573
POROUS LAMINATE
Calvin W. Emmerson, Mooresville, and Jack E. White, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 15, 1969, Ser. No. 850,567
Int. Cl. F01d *5/08*
U.S. Cl. 416—90 **11 Claims**



A porous sheet adapted for transpiration cooling, as in turbine blades, is made up of plural layers of metal bonded together with bosses projecting from the surfaces of the layers to create a space or passage between layers and with pores through the layers, the pores in each layer being out of register with those in the adjacent layer or layers. The pores extend through the sides of the bosses thus reducing the mass of the bosses and facilitating control of the permeability of the sheet.

3,606,574
COOLED SHROUDED TURBINE BLADE
Henry J. Brands, Joseph W. Savage, and Frederick C. Herzner, Cincinnati, Ohio, assignors to General Electric Company
Filed Oct. 23, 1969, Ser. No. 868,785
Int. Cl. F01d *5/18*
U.S. Cl. 416—96 **2 Claims**



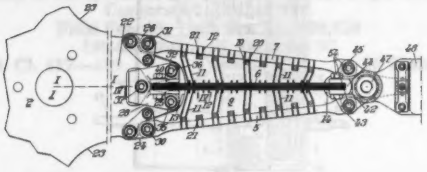
A hollow turbine blade is provided with a circumferential shroud segment at its outer end. A circumferential plenum directs cooling fluid from the blade to holes which extend to the inner surface of the shroud segment to provide for cooling of the shroud. The plenum is of arched construction for maximum strength.

3,606,575

RIGID HUBS FOR VARIABLE PITCH ROTORS

Lucien Edmond Lermusiaux, Saint-Etienne, France, assignor to Societe de Construction et d'Exploitation de Materiels et Moteurs S.C.E.M.M., Paris, France

Filed Feb. 10, 1969, Ser. No. 797,997
Claims priority, application France, Feb. 12, 1968, 139,576
Int. Cl. B64c *27/38*
U.S. Cl. 416—135 22 Claims



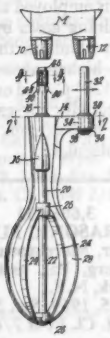
The hub comprises a rotary axle, a hub body rigidly secured to this axle, and arms fixed to the hub body, The variable pitch blades are fixed to the free ends of the arms. Each arm comprises at least three bundles of piled strips, these bundles being distrbuted about the pitch variation axis of the corresponding blade. The bundles of any one arm are connected to each other and to the hub body by holding means—namely rigid collars and sheets—such that the arm possesses a high resistance to flexion and a relatively low resistance to torsion.

3,606,576

DRIVE FOR A PORTABLE MIXING APPLIANCE

Frederick G. J. Grisé, Ware Point Road, West Brookfield, Mass. 01585

Filed Dec. 5, 1969, Ser. No. 882,674
Int. Cl. B01f *7/00*
U.S. Cl. 416—170 6 Claims



A single beating element for operation by an electric motor having a pair of rotary driving members, including a shaft to be clutched to one of said driving members and a rod for non-clutching engagement with the other of said driving members.

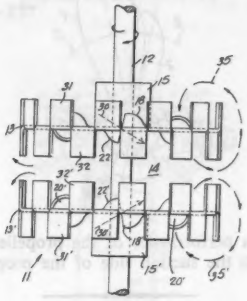
3,606,577

ROTOR BLENDER

Leroy J. Conn, 11 S. Marion St., Warren, Pa. 16365

Filed Feb. 20, 1969, Ser. No. 801,061
Int. Cl. B67d *5/56*
U.S. Cl. 416—181 7 Claims

A double-blade cutting and blending rotor consisting of a pair of axially-spaced symmetrically oppositely-designed circular blades having impeller cups and vertical or inclined peripheral material-cutting teeth. The opposing symmetrical arrangement is such as to push liquid and solid material carried therein from above and below into



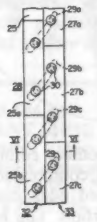
the space between the blades, from whence the liquid and material travels outwardly and is subjected to cutting action by the vertical or inclined outwardly-projecting cutting teeth.

3,606,578

CONTINUOUS SHROUDING-RIVETED CONSTRUCTION

Ralph J. Ortolano, Eastview, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,282
Int. Cl. F01d *5/22*
U.S. Cl. 416—191 5 Claims



A circular shrouded rotor blade structure for an elastic fluid axial flow turbine or compressor comprising an annular row of blades and an annular series of arcuate segments associated with the blades and arranged in end-to-end relationship to form a continuous 360° shroud, wherein each pair of neighboring shroud segments is firmly riveted to a blade common to both with each segment being riveted to at least two blades. There may be more than one row of arcuate segments forming the shroud.

3,606,579

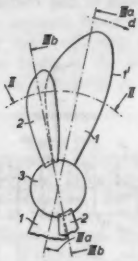
PROPELLER

Henry Mehus, Kampens plass 12, Stavanger, Norway

Filed Jan. 22, 1969, Ser. No. 792,972
Int. Cl. B63h *1/26*
U.S. Cl. 416—200 1 Claim

A propeller of the marine screw type having a main blade and an auxiliary blade located at the discharge end of the main blade, said blades having a slot running therebetween at the trailing edge of the main propeller blade. The width of the slot in cross sectional area reduces its size from the pressure side of the blade towards the suction side of the blade to create a throttle effect resulting in an increase in water flow velocity through the slot and

a reduction of the pressure in the suction side of the propeller. The structure so presented reduces cavitation



and improves performance of the propeller by reducing turbulence on the suction side of the propeller blade.

3,606,580

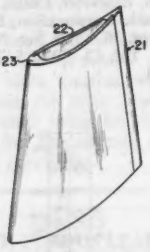
HOLLOW AIRFOIL MEMBERS

Ralph O. Kaufman, Sr., Titusville, Pa., assignor to Cyclops Corporation, Universal-Cyclops Specialty Steel Division, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 823,924, May 12, 1969. This application Sept. 10, 1969, Ser. No. 864,927

Int. Cl. F01d *5/18*

U.S. Cl. 416—232 3 Claims



A hollow airfoil member comprising at least two connected wrought metal components, each component having a specially formed edge configuration and a plain formed remaining portion. The hollow airfoil member is formed by connecting the plain formed portion of the first component with the specially formed edge configuration of the second component and connecting the plain formed portion of the second component with specially formed edge configuration of the first component, these connections being inward from the outer extremities of the specially formed edge configurations.

3,606,581

MOTOR, PUMP AND BLOWER ARRANGEMENT FOR OIL BURNERS

Kyrre G. Sjotun, Langeso, near Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

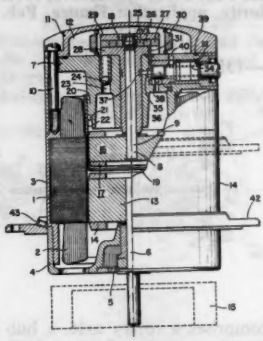
Filed Oct. 6, 1969, Ser. No. 863,793

Claims priority, application Germany, Oct. 16, 1968, P 18 03 315.3

Int. Cl. F04b *31/00, 49/00, 49/06*

U.S. Cl. 417—45 4 Claims

The invention relates to an electric motor driven pump and blower assembly for oil burners. The assembly includes a single stage asynchronous motor having first and second independently rotatable rotors and a common stator. The rotors are respectively of greater and lesser inertia with the blower being connected to the first rotor and the pump being connected to the scond rotor. The pump operates to pump oil when turned in one direction but is inoperative in the opposite direction. This apparatus is operated with a secondary winding and switching means so that, upon starting, the pump is first turned in the inoperative direction and, upon the blower reaching its normal operating speed, the pump direction is



reversed so that there is a lag between the time the blower begins operating and the pump begins pumping. Upon stopping, both rotors are de-energized at the same time but the larger inertia of the blower rotor will cause the blower to rotate after the pump rotor has stopped.

3,606,582

SORBENT FOR VACUUM PUMP AND METHOD FOR THE UTILIZATION OF SAID SORBENT

Francois Prevot, Antony; and Zbigniew Sledziewski, Cachan, France, assignors to Commissariat a l'Energie Atomique, Service du Developpement Industriel, Paris, France

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,171

Claims priority, application France, Sept. 25, 1968, 167,483

Int. Cl. C09c *1/36;* F04b *37/02;* H01j *7/18*

U.S. Cl. 417—48 5 Claims

Titanium monoxide is employed as novel getter material for capturing and retaining gases by means of a sorption pump. Compared with titanium, the novel material possesses an appreciably higher absorption capacity at all temperatures below —120° C. and especially below —195° C., displays lower selectivity for gases, is capable of absorbing the rare gases and exhibits a high probability of capture of rare gas molecules.

3,606,583

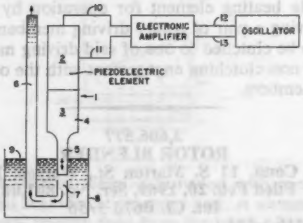
ULTRASONIC PUMPS

Donald J. Coughenour, Morristown, N.J., and James N. Tomlinson, Boalsburg, Pa., assignors to The Singer Company, New York, N.Y.

Filed July 25, 1969, Ser. No. 844,875

Int. Cl. F04f *7/00*

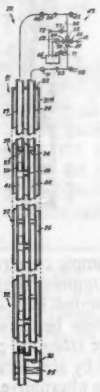
U.S. Cl. 417—53 6 Claims



A pump for ultrasonically pumping liquids has a stepped ultrasonic resonator, a conduit and means to vibrate the resonator. The tip of the resonator is submerged in

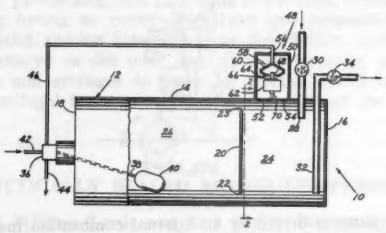
the liquid to be pumped, wherein the tip is disposed adjacent to and facing the open mouth of the conduit through which the liquid is to be pumped. The vibrating tip of the resonator forces the liquid into the mouth of the conduit. A succession of impulses, caused by the vibrating tip, pumps the liquid through the conduit.

3,606,584
WELL TOOLS
Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Filed Feb. 19, 1969, Ser. No. 800,539
Int. Cl. F04f *1/18;* **E21b** *43/00*
U.S. Cl. 417—109 **26 Claims**



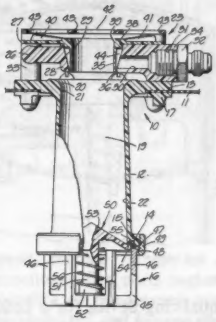
A well tool system, particularly adapted to producing wells by gas lift, including spaced parallel tubing strings interconnected by cross-over assemblies for introducing lift gas into a well through one tubing string and production of well fluids through the other tubing string independently of the casing annulus which may remain liquid full during the gas lift procedure.

3,606,585
FLUID PRESSURE DRIVEN PUMP
Leon C. Graves, P.O. Box 381
Rock Springs, Wyo. 82901
Filed Oct. 20, 1969, Ser. No. 867,504
Int. Cl. F04f *1/06*
U.S. Cl. 417—127 **1 Claim**



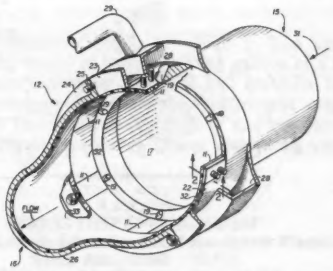
A pump for moving liquids wherein the prime mover is pressurized gas acting to force liquid from a vessel. Continuous pumping action is accomplished through the interaction of a float-controlled two-way valve in the pressurized gas supply line and check valves in the liquid lines to control and time the periods and directions of fluid flow through the vessel.

3,606,586
AIR INJECTION PUMP
Meyer Piet, Arcadia, and Murray A. Chilcoat, Monterey Park, Calif., assignors to Futurecraft Corporation, City of Industry, Calif.
Filed July 14, 1969, Ser. No. 841,412
Int. Cl. F04f *5/48, 5/18*
U.S. Cl. 417—177 **2 Claims**



An air injection pump in which a nozzle has parts in fixed coacting relation to form an outlet opening for discharging an annular stream of pressurized fluid at a relatively high velocity into the throat end of a venturi passageway for inducing a large quantity of ambient outside fluid such as air to enter the passageway through flow paths interiorly and exteriorly of the annular nozzle discharge stream, so as to provide a combined flow of the streams through the passageway which will have a substantially uniform velocity gradient across the passageway, and thereby produce greater efficiency of the pumping operation.

3,606,587
WEAR RESISTANT SHOE FOR PUMPS
William G. Fraser, Castro Valley, Calif., assignor to Fruehauf Corporation
Filed Feb. 26, 1969, Ser. No. 802,522
Int. Cl. F04f *5/36, 5/46*
U.S. Cl. 417—195 **4 Claims**

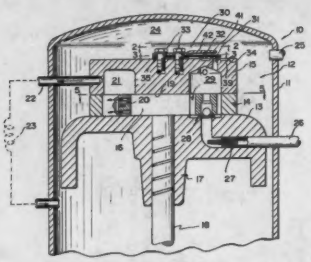


A jet pump having multiple peripheral jet orifices is provided with individually replaceable wear resistant shoes downstream of the jet nozzle at the point of greatest wear to the pump wall due to the abrasive action of particles entrained in the fluid being pumped by the jet of fluid emitted from the nozzles.

3,606,588
PRESSURE EQUALIZING MEANS FOR COMPRESSORS AND THE LIKE

Bert W. Romerhaus, Haubstadt, Ind., assignor to Whirlpool Corporation

Filed Apr. 10, 1969, Ser. No. 814,908
Int. Cl. F04b 49/00
U.S. Cl. 417—292 5 Claims

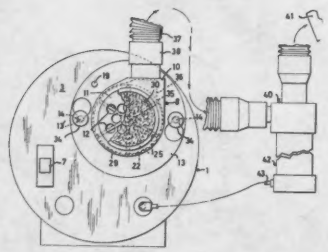


A pressure equalizing device for a compressor wherein a valve controlled passage between a high pressure chamber and a suction chamber of the compressor is provided for equalizing the pressure in the suction chamber and the high pressure chamber during start-up of the compressor. The compressor comprises a rotary compressor having a rotor disposed in the compression chamber for compressing fluid such as refrigerant fluid which is precooled and then delivered to the high pressure chamber for delivery to associated apparatus such as refrigeration apparatus. The fluid is returned to the suction chamber of the compressor through a return inlet which is provided with a check valve for preventing reverse flow from the suction chamber.

3,606,589
BLOWER STRUCTURE FOR RESPIRATORY AIR

Leon Robert Cameto and Raleigh Joseph Harris, Oakland, Calif., assignors to Mist O_2 Gen Equipment Co., Oakland, Calif.

Filed July 16, 1970, Ser. No. 55,337
Int. Cl. F04b 17/00; F04d 29/00
U.S. Cl. 417—360 4 Claims

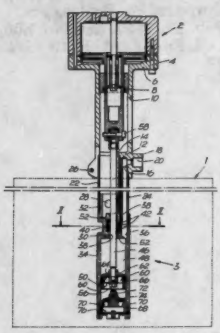


Apparatus for circulating air for inhalation and for incorporating in said air, therapeutic aerosol, which apparatus includes a conduit having a motor-driven blower therein, through and past which blower the air for respiration by a patient is moved. Said blower and conduit are substantially isolated from the motor housing, but are carried thereby and are quickly removable from the motor and its housing for sterilization, and are quickly reattached.

3,606,590
GLUE PUMP

Fritz Gebhardt, Nurtingen, and Anton Abt, Oberboihingen, Germany, assignors to Karl M. Reich Maschinenfabrik, Nurtingen, Germany

Filed Sept. 2, 1969, Ser. No. 854,433
Claims priority, application Germany, Sept. 13, 1968, G 67 50 882
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—360 2 Claims

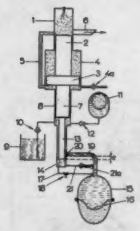


A pump of a very simple construction in which a piston is reciprocated by a compressed air motor within a cylinder which may be inserted into a container from which glue or another fluid may be drawn into the cylinder and pumped under pressure from the pump outlet. The pumping effect is produced by the reciprocation of the piston in cooperation with the alternative operation of two check valves one of which is provided on the piston and the other in the free lower end of the cylinder. The pump is designed so as to permit the most easily worn parts to be very easily and quickly exchanged when necessary.

3,606,591
PUMP AND DRIVING MOTOR ASSEMBLY

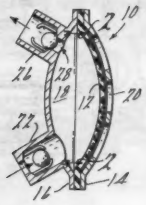
Theodorus Gerhardus Potma, Oosteinde 124, Berkhout, Netherlands

Filed Oct. 8, 1969, Ser. No. 864,580
Claims priority, application Netherlands, Oct. 8, 1968, 6814405
Int. Cl. F02b 71/00; F04b 31/00
U.S. Cl. 417—364 5 Claims



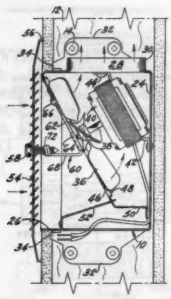
A pump is driven by an internal combustion motor of the so-called free piston type. The motor piston is fixedly attached to the pump piston. The return stroke of the motor piston is effected by the application of a pressure medium either to the pump piston or to a separate resetting piston fixedly attached to the motor piston. The working frequency of the assembly is controlled by means of a regulating valve restricting the flow of the pressure medium in a first portion of the return stroke.

3,606,592
FLUID PUMP
Joseph P. Madurski and Ambrose Tomala, Royal Oak, Mich., assignors to The Bendix Corporation
Filed May 20, 1970, Ser. No. 39,952
Int. Cl. F04b 19/02, 43/02
U.S. Cl. 417—413 6 Claims



A displacement element for a fluid pump comprised of opposed, connected members of a memory heat treatable material such as 55–Nitinol with an electrical control circuit used to alternately cause each of the members to assume its memory heat treated configuration, thereby causing cyclical movement of the members. This movement is utilized to create the pumping action by embedding these elements in a diaphragm element to create a diaphragm pump.

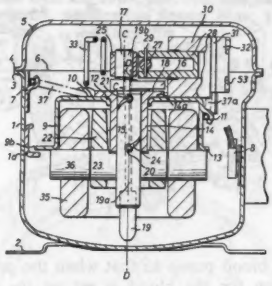
3,606,593
EXHAUST FAN
Robert E. Steiner, Creve Coeur, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed June 30, 1969, Ser. No. 837,471
Int. Cl. F04d 25/06; F24f 7/00; H02k 17/10
U.S. Cl. 417—423 6 Claims



A compact, low-cost, exhaust fan for mounting within a room partitioning wall or ceiling comprising, a blower housing having an outlet offset from and perpendicular to its inlet and an axial flow type fan therein, with its axis centered in the inlet and lying at an acute angle thereto and arranged to move air through the housing by centrifugal force as well as by the pitch of the fan blades.

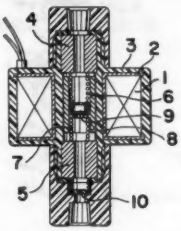
3,606,594
HERMETICALLY SEALED MOTOR/COMPRESSOR APPARATUS
Ronald William Lewis and Eric Smith, Bognor Regis, England, assignors to Lec Refrigeration Limited, Bognor Regis, England
Filed May 25, 1970, Ser. No. 40,314
Claims priority, application Great Britain, Aug. 27, 1969, 42,681/69
Int. Cl. F04b 17/00, 35/04
U.S. Cl. 417—415 20 Claims

The present invention relates to hermetically sealed motor compressor apparatus and methods of assembling them, such apparatus being for instance used in the cooling systems of mechanical refrigerators. Apparatus according to the invention comprises a casing formed from at least two parts to contain a motor compressor with



its resilient support, flexible refrigerant discharge pipe and electric connections. The parts register hermetically to embrace a plurality of pre-formed component members which are incorporated and housed therein in accordance with the method of the invention.

3,606,595
ELECTROMAGNETIC PUMP UTILIZING A PERMANENT MAGNET
Hideo Takamizawa, Higashi-Matsuyama-shi, Japan, assignor to Jidosha Kiki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 20, 1970, Ser. No. 4,286
Claims priority, application Japan, Feb. 3, 1969, 44/7,346
Int. Cl. F04b 35/04
U.S. Cl. 417—417 1 Claim

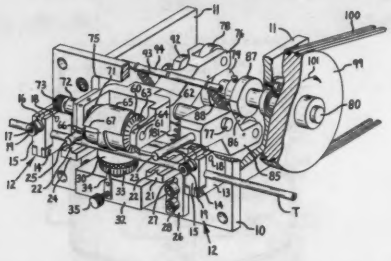


An electromagnetic pump in which a fluid can be pumped up by means of a reciprocating motion of a magnetic armature moved by attractive and repulsive forces which act alternately between two permanent magnets inserted in a resin molded pump body and the movable magnetic armature magnetized by an alternating current.

3,606,596
DRUG DISPENSING PUMP
Miles Lowell Edwards, 13191 Sandhurst Place, Santa Ana, Calif. 92705
Filed Apr. 14, 1970, Ser. No. 28,364
Int. Cl. F04b 43/08
U.S. Cl. 417—479 12 Claims

A positive displacement elastic tube pump having two separate adjustments for varying the rate of flow through a wide range. A portion of the tube between inlet and outlet pinch valves is alternately compressed against a platen and released by a reciprocating pressure shoe which bears against a variable length of the tube. The pressure shoe comprises a drum having a variable length effective

surface acting on the tube which is adjustable by rotation of the drum. The effective length of stroke of the pressure shoe is variable by adjusting the platen toward and away from the pressure shoe. The pump is adapted to be



driven by a blood pump so that when the proper dosage of medication for the blood is set on the drug pump, a change in speed of the blood pump will not alter the blood-medicine ratio.

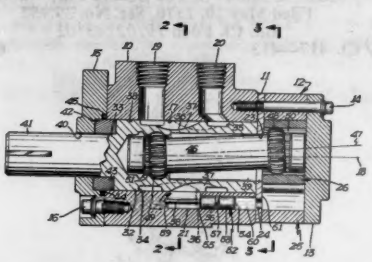
3,606,597
PUMP
Linus E. Russell, Springfield, Ohio, assignor to Peters and Russell, Inc., Springfield, Ohio
Filed June 5, 1969, Ser. No. 830,761
Int. Cl. F04b *11/00*
U.S. Cl. 417—542 **3 Claims**

This invention relates to a simple, small, relatively quiet and economical, high efficiency fluid pump. It is distinguished by a pump housing constituted by a tube section compartmented by a diametral plate angled to the line of flow and capped by end plates simply interconnected, one of which mounts thereon an eccentric drive for a diaphragm type pumping element bridging an opening in the housing.

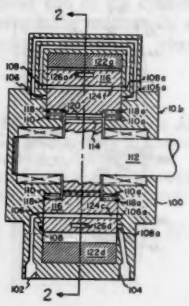
This invention relates, accordingly, to improvements in pumps and will be illustrated, more particularly, by preferred embodiments in the nature of diaphragm type pumps.

3,606,598
FLUID OPERATED MOTOR
Kenneth A. Albers, Bloomington, Minn., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Apr. 8, 1970, Ser. No. 26,636
Int. Cl. F01c *1/02*; F03c *3/00*; F04b *35/02*
U.S. Cl. 418—61 **8 Claims**

A fluid operated motor of the gerotor displacement mechanism and axial valve type wherein the gerotor displacement mechanism and fluid displaced therein is isolated from operating fluid controlled by the motor valve and wherein the displacement mechanism fluid is responsive to operating fluid controlled by the valve thereby increasing the efficiency of the motor.



3,606,599
FLUID POWERED ACTUATOR HAVING FLUID DISPLACEMENT CHAMBERS FORMED BETWEEN HOUSING AND RING GEAR
Kenneth W. Verge, Farmington, Mich., and George I. Boyadjieff, Woodland Hills, Calif., assignors to The Bendix Corporation
Original application Oct. 30, 1967, Ser. No. 678,951, now Patent No. 3,516,765, dated June 23, 1970. Divided and this application Apr. 10, 1970, Ser. No. 27,276
Int. Cl. F01c *1/02, 1/42*
U.S. Cl. 418—61 **4 Claims**

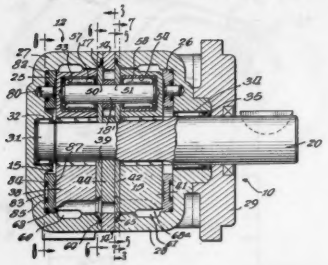


A fluid actuated integrated motor-transmission unit in which an output gear and a coaxial stationary gear coact with a driven eccentric ring gear that is free floating and meshes therewith to provide for a direct drive of the output gear by driving the ring gear so that the axis thereof orbits about the output gear axis. The ring gear is driven by sequentially pressurizing and exhausting a series of fluid displacement chambers formed between the floating ring gear and an enclosing housing.

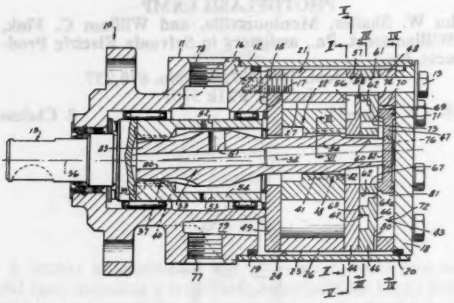
3,606,600
HYDRAULIC MOTOR
Frederic W. Pollman, Rockford, Ill., assignor to Sundstrand Corporation
Filed June 12, 1969, Ser. No. 832,637
Int. Cl. F01c *1/22, 19/08*
U.S. Cl. 418—61 **8 Claims**

A low speed, high torque motor having a stationary ring gear with internal teeth and an output shaft mounted carrier which supports a plurality of planet gears that in-

terengage the ring gear and form expanding and contracting fluid chambers as the carrier rotates with respect to the ring gear. The carrier has portions sealingly and slidably engaging the sides of the ring gear dividing the housing into chambers on either side of the gears, either of which may be the inlet or outlet chambers, depending upon the desired direction of rotation. Communicating with one of the chambers are a plurality of ports that extend axially through the carrier and communicate continuously with the expanding fluid chambers defined by the planetary gears and the ring gear, and communicating with the other chamber in the housing are a plurality of axially extending ports in the carrier that communicate with the contracting fluid chambers defined by the gears, there being provided pressure balancing plates at each axial end of the carrier for the purpose of pressure balancing the carrier.

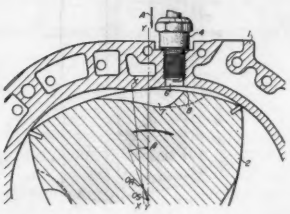


3,606,601
HYDRAULIC DEVICE
Hollis N. White, Jr., West Lafayette, and Max K. Biery, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Filed Oct. 21, 1969, Ser. No. 868,151
Int. Cl. F01c *1/02, 1/42*
U.S. Cl. 418—61 **1 Claim**



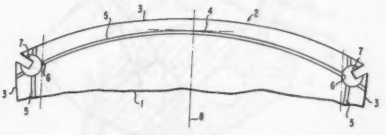
A hydraulic device having a gerotor gear set including a pair of gears one of which rotates and orbits relative to the other, a work shaft rotatable on a fixed axis and an intermediate or wobble shaft interconnecting said one gear and said work shaft for joint rotation. The wobble shaft is connected to said one gear and to said work shaft by spline connections the male tooth portions of which comprise more than fifty percent and no more than sixty percent of the circular pitches thereof.

3,606,602
COMBUSTION CHAMBER OF ROTARY PISTON ENGINE
Yoshitugu Hamada and Noritoshi Taniguchi, Nagahamashi, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan
Filed Oct. 23, 1969, Ser. No. 868,848
Claims priority, application Japan, Nov. 15, 1968, 43/99,071
Int. Cl. F01c *1/02, 1/42*
U.S. Cl. 418—61 **3 Claims**



A recess having the leading end portion thereof bifurcated is formed in each section of the rotor at such a location that the time when said recess is brought into communication with an inner opening of the ignition plug mounting hole in the cylindrical housing coincides or substantially coincides with the time when the ignition plug sparks.

3,606,603
SEALING STRIP AT THE PISTON OF A ROTARY-PISTON INTERNAL COMBUSTION ENGINE
Karl-Walter Schmidt, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Nov. 24, 1969, Ser. No. 879,182
Claims priority, application Germany, Nov. 22, 1968, P 18 10 363.4
Int. Cl. F01c *19/08*
U.S. Cl. 418—142 **2 Claims**

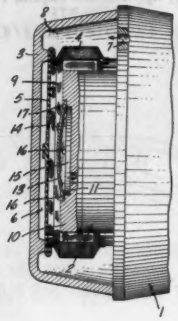


A sealing strip of a rotary-piston internal combustion engine, especially of trochoidal construction, wherein the sealing strip is arranged in grooves of the end walls of the piston and extends in an arch from a sealing bolt in one corner of the piston to a sealing bolt in the adjacent corner of the piston. The sealing strip abuts the sealing bolts with its butt ends; the butt ends are substantially flat and essentially parallel to a line perpendicular to a tangent at the apex of the sealing strip arch.

3,606,604
LIQUID PUMP WITH AUTOMATIC VARIABLE SUCTION CONTROL
Jorgen H. Petersen, Fribjerg 30, Nordborg, Denmark
Filed June 23, 1969, Ser. No. 835,637
Int. Cl. F01c *1/10*
U.S. Cl. 418—191 **3 Claims**

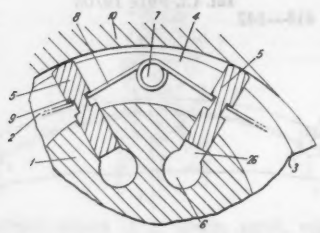
This relates to an improvement in a suction pump and more particularly to a gear pump used to pump fuel oil to a burner. A partition plate is placed over an orifice which leads to a suction port of the pump and the partition plate is provided with a plurality of angularly spaced

notches positioned around the periphery thereof. The cumulative size of all the notches is chosen such that the volume of liquid which can pass through all the holes is more or less equal to the capacity of the pump. The



notches ensure that any air that is drawn by the pump is whipped around and intermixed with the liquid to such an extent that the resulting size of the air bubbles have no effect upon a flame of the fuel burner.

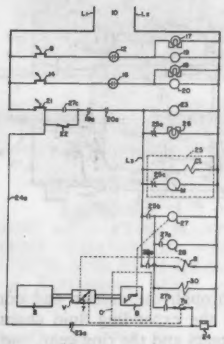
3,606,605
ROTARY VANE PUMP
Fritz Ostwald, Buchschlag, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Jan. 15, 1970, Ser. No. 3,135
Int. Cl. F01c *1/00*; F04c *1/00, 15/00*
U.S. Cl. 418—253 **6 Claims**



A rotary sliding vane pump in which the vane springs are positioned in the working chambers and engage recesses in the sides of the vanes to press the vanes outward against the cam plate.

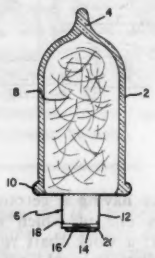
3,606,606
OVEN BURNER CONTROL SYSTEMS
Gerald J. Luther, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.
Filed Oct. 6, 1969, Ser. No. 864,128
Int. Cl. F23n *5/00*
U.S. Cl. 431—66 **12 Claims**

An oven burner control system for maintaining the operation of the oven burner system of a baking oven for bakery products during power failures of short duration. The oven burners are adapted to be connected with a source of gaseous fuel through an electrically controlled valve adapted to be connected with a source of electrical power. The control valve is manually movable to an open fuel supplying position and a control element is operable to hold the control valve in the open position so long as the electrical signal from the power source remains substantially constant. Electrically operable and normally continuously energized fuel ignitors are provided for igniting the fuel. Timer apparatus is provided for precluding operation of the fuel ignitors for a predetermined time at the commencement of a baking cycle to accomplish purging of the oven prior to ignition. At the end of the cycle the timer is reset when the power is turned off. To prevent the timer from being reset during a



momentary interruption of power and from commencing its timing cycle when power is resumed, power is supplied to the timer for a short time after there is a power source interruption. Relay means is connected in parallel with the timer apparatus for controlling the fuel ignitors. Time delay control apparatus is connected in circuit with the control valve, the relay apparatus, the timer, and the power source to delay the effect which an electrical signal interruption otherwise would have on the control valve, relay apparatus, and timer. Interchangeable connectors are provided for selectively connecting the time delay control apparatus into the circuit.

3,606,607
PHOTOFLASH LAMP
John W. Shaffer, Montoursville, and William C. Fink, Williamsport, Pa., assignors to Sylvania Electric Products, Inc.
Filed Sept. 25, 1967, Ser. No. 670,237
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **2 Claims**



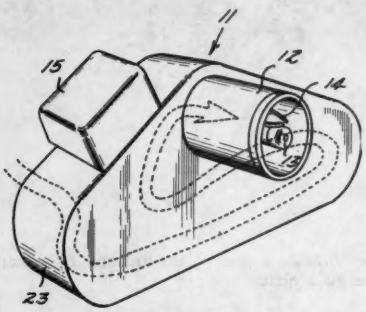
A percussive-type photoflash lamp having an anvil with a flat working face seated on a rim around a coined depression formed in the bottom of the primer shell.

3,606,608

ENCASEMENT AND FUEL BURNER ASSEMBLY

Lorin G. Miller and James H. Miller, both of 220 S. River, Eaton Rapids, Mich. 48910, and William W. Miller, 6022 Rolf St., Lansing, Mich. 48827

Filed Feb. 28, 1969, Ser. No. 802,583
Int. Cl. F23d 11/38
U.S. Cl. 431—121 4 Claims



A housing and consequent mounting arrangement for fan, pump and fuel burner components, and controls therefor and in which encasement air is circulated in heat exchange relation to the components thereof and injected in preheat relation to the fuel burner as primary, secondary and tertiary air supply.

3,606,609

BURNER FOR CHAFING DISH AND THE LIKE

Herman A. Lipper, 36 Hickory Road, Woodmere, N.Y. 11598, and Yukinari Itoh, 68 Fukuzumi-cho, Nakagawa-ku, Nagoya, Japan

Filed Dec. 9, 1969, Ser. No. 883,421
Int. Cl. F23q 25/00; F24c 5/00
U.S. Cl. 431—152 7 Claims

A burner adaptable for use with either liquid fuel or solid fuel, including a removable receptacle for liquid fuel which is replaceable by a standard-sized can of solid fuel.

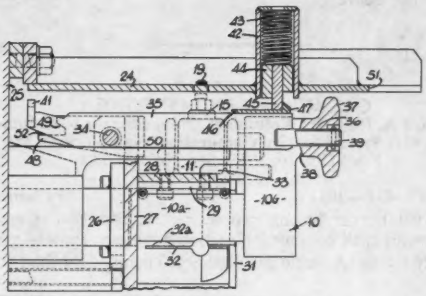
3,606,610

FUEL BURNER ASSEMBLIES

Harold William Leach, Liverpool, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 3, 1969, Ser. No. 863,590
Int. Cl. F23d 11/36
U.S. Cl. 431—153 7 Claims

A fuel burner assembly comprising a burner, a support structure for the burner and a fixed structure on which the support structure is mounted, the support structure and burner being movable between a first position in which the burner is in the hot zone of a boiler and in which position the burner cannot be removed from the support structure since a clamp cannot be released, and a second position in which the burner can be removed



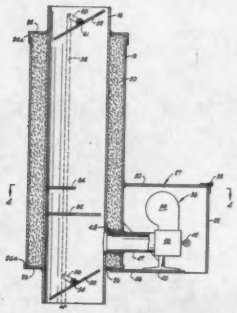
from the support structure by releasing the clamp, and the fixed structure and support structure carrying respective parts whereby the burner cannot be inserted into the support structure unless the latter occupies its second position, the support structure carrying a valve which is only in the on position when the burner and support structure are in the first and operative position.

3,606,611

AFTERBURNER

Nelson R. Wright, Oklahoma City, Okla., assignor to Environmental Control Sales Corporation, Oklahoma City, Okla.

Filed Oct. 24, 1968, Ser. No. 770,274
Int. Cl. F23d 13/20
U.S. Cl. 431—202 10 Claims

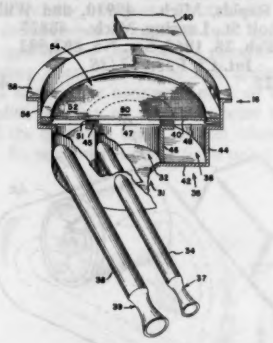


An afterburner for attachment to stacks and flues for the purpose of burning residual products of incomplete combustion, the afterburner including an elongated titanium inner sleeve concentrically surrounded by a shorter metallic outer sleeve with a thermal insulating material positioned between the inner and outer sleeves. A pair of damper plates are located in the upper and lower ends of the inner sleeve, and are movable to selected positions of closure within the inner sleeve. A burner is secured to

the side of the inner sleeve at a location above the lower damper plate, and is constructed to burn a mixture of fuel and air and direct the flame in a generally tangential direction into the lower end of the inner sleeve. A pair of vertically spaced, circumferentially staggered, semi-circular baffle plates are secured within the inner sleeve at a location above the burner and function to impart a spiralling or helical motion to gases moving upwardly in the inner sleeve.

3,606,612
GAS BURNER AND CONTROL
Edward A. Reid, Jr., Columbus, Ohio, assignor to Columbia Gas System Service Corporation, New York, N.Y.
Filed Oct. 20, 1969, Ser. No. 867,722
Int. Cl. F23q *9/08*
U.S. Cl. 431—281 **19 Claims**

A gas burner having two concentric combustion sections with each combustion section having a separate gas supply nozzle. A single gas discharge chamber for the two sections is located above the burner and is closed except for a gas discharge flue. Heat is transmitted by infrared radiation through a glass plate top and by conduction from the glass plate.



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Ault, Wayne E., 3,605,902.
Latina, Roland N., 3,605,117.

AB Casco: *See—*
Heden, Ake E.; and Ulfvarson, Ulf O., 3,605,688.

AB Gustavsbergs Fabriker: *See—*
Nilsson, Sten Lennart, 3,605,816.

AB Tetra Pak: *See—*
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AB Volvo Penta: *See—*
Bergstedt, Karl Abdon, 3,605,677.

Abraham, James G.: *See—*
Willke, Herbert L.; and Abraham, James G.,3,606,251.

Abromavage, John C.; and George, James F., to Advanced Management Engineering & Research Co. Instrument transport and positioning system. 3,606,045, Cl. 214-89.

Abt, Anton: *See—*
Gebhardt, Fritz; and Abt, Anton,3,606,590.

ACF Industries, Incorporated: *See—*
Hammonds, James C.; and Dare, Roy R., 3,606,219.
Hammonds, James C.; Randolph, Robert W.; and Yeates, Richard P., 3,606,220.
Wynn, Robert O., 3,605,948.

Acme Highway Products Corporation: *See—*
Bowman, Thomas C., 3,605,586.

Acme-Hamilton Manufacturing Corporation: *See—*
Bauman, Joseph F.; and Caserta, Thomas A., 3,605,189.
Bauman, Joseph F.; Kurtz, Edward, Jr.; and Cini, Adrian V., 3,605,817.

Adams, Corwin E.: *See—*
Rousseau, Kenneth E.; and Adams, Corwin E.,3,606,371.

Adams, Lenard P.; and Adams, Roy S. Automatic fish catcher. 3,605,315, Cl. 43-16.

Adams, Roy S.: *See—*
Adams, Lenard P.; and Adams, Roy S.,3,605,315.

Adams, Wilbur Henry. Polyhedrons having depressible vertices and internal means for restoring shape. 3,605,324, Cl. 46-42.

Addmaster Corporation: *See—*
Clary, John G., 3,605,612.

Addressograph-Multigraph Corporation: *See—*
Maloney, William R.; and Pleitt, Richard J., 3,605,692.
Petrick, Edward J.; and Schmidlin, Raymond J., 3,606,309.
Shelffo, Loren E.; Mathisen, Henry A.; and Schwager, Frank L., 3,606,532.

Adler, Michael, to Maschinenfabrik Loesch GmbH. Apparatus for distributing objects. 3,605,982, Cl. 198-30.

Advance Construction Equipment, Inc.: *See—*
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Advanced Management Engineering & Research Co.: *See—*
Abromavage, John C.; and George, James F., 3,606,045.

Adwest Engineering Limited: *See—*
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Millard, Barry John, 3,605,934.

Aerojet-General Corporation: *See—*
Coon, Seneca G. Jr., 3,605,999.
McGouch, Charles B., 3,605,408.
Wagoner, Robert B.; and Kinghorn, John S., 3,606,071.

Aeroquip Corporation: *See—*
Crissy, Charles F., 3,605,205.
Rutan, Louis W., 3,606,439.

AGA Aktiebolag: *See—*
Westberg, Johan Eric Hayden, 3,606,142.

Aikawa, Kentaro; and Tahara, Mamoru, to Mitsubishi Jukogyo Kabushiki Kaisha. Transporting means and equipment for jet energy of geothermal power plant. 3,605,403, Cl. 60-26.

Ainsworth, Laine J., to Kelsey-Hayes Company. Steerable driving axle. 3,605,930, Cl. 180-43.

Air Pollution Research & Developing Corporation: *See—*
Erwin, Jimmy R.; Lockhart, Edward Ray; and Justice, Robert Lee, 3,605,386.

Air Preheater Company, Inc., The: *See—*
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Air Products and Chemicals, Inc.: *See—*
Pryor, John A.; and Rowles, Howard C., 3,605,422.

Air-Spread, Inc.: *See—*
Wall, George B., 3,506,097.
Wall, George B., 3,606,097.

Akashi, Goro; Fujiyama, Masaaki; and Hirakawa, Takashi, to Fuji Photo Film Co., Ltd. Cassette encapsulating magnetic recording tape. 3,606,203, Cl. 242-199.

Akers, Richard L., to Du Pont de Nemours, E. I., and Company. Plural cycle cam yarn winding process and packages produced thereby. 3,606,197, Cl. 242-176.

Aktiebolaget Electrolux: *See—*
Hultstrom, Carl Lennart; Eriksson, Bolik Anders; and Arksten, Elvin Efraim, 3,606,420.

Aktiebolaget Svenska Kullagerfabiken: *See—*
Hallerback, Stig Lennart, 3,606,351.

Aktiebolaget Svenska Kullagerfabriken: *See—*
Asberg, Sture; and Timmer, Hendrikus J. M., 3,606,503.

Alarcon, Peter G., to Gateway Industries, Inc. Safety belt buckle. 3,605,209, Cl. 24-230.

Albers, Kenneth A., to Eaton Yale & Towne, Inc., mesne. Fluid operated motor. 3,606,598, Cl. 418-61.

Albertson, Stanley E., Jr. Wrist control device. 3,606,342, Cl. 273-189.

Alcan Aluminum Corporation: *See—*
Vecchiarelli, Francis, 3,605,852.

Alco Standard Corporation: *See—*
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Alderman, Edwin N., Jr.: *See—*
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Alexander, Donald K.; and Denovan, John J., to Koehring-Waterous, Ltd. Wood pulp grinder. 3,606,177, Cl. 241-42.

Alexander, James, to Scandia Packaging Machinery Company. Machine for securing tab to package. 3,605,379, Cl. 53-134.

All States Plastic Manufacturing Co., Inc.: *See—*
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Allard, Charles D.; Allard, Eugene R.; and Newlon, Robert Ross. Life support cart. 3,606,302, Cl. 269-325.

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Allen, James W.: *See—*
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Allenbaugh, Howard M., 1/3 to Majera, Louis Martin, and 1/3 to Goebel, Charles. Air scoop means for automotive vehicles. 3,606,444, Cl. 296-1.

Allied Chemical Corporation: *See—*
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Allied Control Company, Incorporated: *See—*
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Allied Industrial Components: *See—*
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Allied Power Industries, Inc.: *See—*
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Allis-Chalmers Manufacturing Company: *See—*
Rowland, Chester A., Jr., 3,606,173.
Schott, Robert E.; and Khatti, Ramkishan, 3,605,391.
Worrix, Matthew L., 3,605,805.

Allison, Robert D., to United States Envelope Company. One-piece envelope with integral, detachable coupons contained therein. 3,606,138, Cl. 229-70.

Allmanna Svenska Electriska Aktiebolaget: *See—*
Lundstrom, Hans, 3,606,286.

Allred, Arthur L. Crank for fishing reel. 3,606,193, Cl. 242-84.1

Alman, Lawrence C., Jr.; Hauber, Jack R.; and Hynes, Frank R., to Xerox Corporation. Multiple size recording apparatus. 3,606,534, Cl. 355-8.

Aluminum Company of America: *See—*
Dunn, Lloyd Graham, 3,606,075.
Kutcher, Howard R.; Trimble, Robert M.; and Von Stocker, Selmer G., 3,605,249.

Ambrosius, Dieter, to Kombinat Veb Pentacon Dresden Kamera-und Kinowerke. Photographic exposure measuring device. 3,606,552, Cl. 356-227.

Amco Production Company: *See—*
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Amengual, Jean. Process and apparatus for automatically and continuously dyeing a textile thread. 3,605,146, Cl. 8-151.1

American Can Company: *See—*
Hanke, Edward Herman; and La Croce, Leonard Thomas, 3,606,076.
Kuchenbecker, Morris W., 3,606,082.
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American Home Products Corporation: *See—*
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American Machine & Foundry Company: *See—*
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Roels, Hans, 3,606,021.
American Optical Corporation: *See—*
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American Potato Company: *See—*
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American Stair Corporation, Inc.: *See—*
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American Standard Inc.: *See—*
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AMF Incorporated: *See—*
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Stapf, William E., 3,606,100.
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Amsted Industries, Incorporated: *See—*
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Amtron, Inc.: *See—*
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Amundsen, Paul D., to Fendall Company. Headband adjuster. 3,605,204, Cl. 24-171.
Ancra Corporation: *See—*
Prete, Ernest, Jr., 3,605,637.
Andale Company: *See—*
Wurster, Alfred; and Tanner, Robert C., 3,605,187.
Anderhoim, Nordin C.; and Goodman, Albert, to United States of America, Atomic Energy Commission. Method and apparatus for measuring adhesion of material bonds. 3,605,486, Cl. 73-95.
Andermont, Gilbert: *See—*
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Andersen, Thor W., to National Distillers and Chemical Corporation. Continuous process and apparatus for drying titanium sponge. 3,605,273, Cl. 34-15.
Anderson Company, The: *See—*
Moorhead, John P.; and Wubbe, Leo J., 3,605,168.
Anderson, Erik. Machine for wrapping rolls. 3,605,382, Cl. 53-380.
Anderson, Hans Christian: *See—*
Sorensen, Nels Hartmann, 3,606,477.
Anderson, Kelvin G.: *See—*
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Anderson, Maurice N. Insulated grill and fire bucket. 3,606,066, Cl. 220-9.
Anderson, Robert H., to Tektronix, Inc. Optical apparatus including a pair of mosaics of optical imaging elements. 3,605,593, Cl. 95-18.
Anderson, Thomas W.: *See—*
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Anderson, Victor F., to Shell Oil Company. Modular furniture embodying a common chassis and interchangeable styling features. 3,606,510, Cl. 312-257.
Ando, Kinji: *See—*
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Ando, Noriyoshi, to Nippon Denso Company Limited. Anti-skid control system for automotive vehicles. 3,606,490, Cl. 303-21.
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Andrews, George M., to Vega Industries, Inc. Fireplace hood and trim structure. 3,605,719, Cl. 126-139.
Angle, Lewis H., to Methods and Improvements Corporation. Programmed character printing means for stamping tubing material. 3,605,976, Cl. 197-6.
Anglin, Paul E.: *See—*
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Anglin, Paul E.: *See—*
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Anglin, William E.; and Anglin, Paul E., 3,606,379.
Anglin, William E.; and Anglin, Paul E., 36.8% to Anglin, William E., 36.8% to Anglin, Paul E., and 26.4% to Trammell Crown Investment Company. Stabilized motor vehicle and stabilizing device therefor. 3,606,379, Cl. 280-150.
Anthon, Frederick B. Abrasive finishing article. 3,605,349, Cl. 51-402.
Appel, David W.; and Sanford, Charles L., to Kimberly-Clark Corporation. Picker for divellicating pulp. 3,606,175, Cl. 241-18.
Appoleton, Bernard Simon, to Unilan A. G. Shock absorber. 3,606,295, Cl. 267-63.
Aqua-Aerobic Systems Inc.: *See—*
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Aquino, Frank J.: *See—*
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Aquino, Joseph A.: *See—*
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Arce, Raul Olvera. Hypodermic syringe. 3,605,743, Cl. 128-218.
Ardito, Gerald J.; Newman, Jerome S.; and Sarris, Samuel E., to Inventions Unlimited Incorporated. Push-pull container and cap assembly. 3,606,107, Cl. 222-546.
Arksten, Elvin Efraim: *See—*
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Armand, Marcel; Charveriat, Michel; and Givord, Jean-Pierre, to Ugine Kuhlmann. Metallurgical bonding. 3,605,254, Cl. 29-473.7
Armco Steel Corporation: *See—*
Buker, Paul S.; Shepard, Richard D.; and Wenaas, David P., 3,606,418.
Willke, Herbert L.; and Abraham, James G., 3,606,251.
Armstrong Cork Company: *See—*
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Arndt, Joseph H., to TRW Inc. Refractive shutter for rotating prism cameras. 3,606,544, Cl. 352-116.
Arnott, Adrian A.: *See—*
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Atwood, Lamar T.; and Gidge, Lester, to Union Carbide Corporation. Apparatus for changing the mesh size of non- woven netting. 3,605,220, Cl. 28-1.
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Thomas, Chester A.; and Shulick, Robert J., 3,605,695.
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Badzioch, Stanislaw; and Hawksley, Peter G. W., to Coal Industry (Patents) Limited. Monitoring dust concentration. 3,605,485, Cl. 73-28.
Baginski, Albert R.; Okada, David T.; Schlau, Floyd E.; and Stastny, Edwin O., to Mattel, Inc. String projecting toy. 3,605,326, Cl. 46-44.
Bagwell, Dennis P. Self-cleaning dining table. 3,605,769, Cl. 134-115.
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Baker Perkins, Inc.: *See—*
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Balint, Andrew, to Bell & Howell Company. Out-of-sync detector for film printers. 3,606,543, Cl. 352-12.

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Baltzer, Walter, to Beleggingsmaatshappij 'Industriebank' N.V. Membrane valve for spray containers. 3,606,088, Cl. 222-94.

Ban, Itsuki. Endless magnetic tape cartridge. 3,606,191, Cl. 242-55.19

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Banner Metals, Inc.: *See—*
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Bard, Martin. Assembly of structure elements. 3,605,363, Cl. 52-241.

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Barker, John R., to British Leyland (Austin-Morris) Limited, formerly British Motor Corporation Limited, The. Joint-making gaskets. 3,606,360, Cl. 277-227.

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Barr, Peter Joachim, to Barr & Murphy Limited. Apparatus for the treatment of pasty substances. 3,605,643, Cl. 107-8.

Barr, William H. Board cutting machine. 3,605,534, Cl. 83-5.

Barredo de Valenzuela, Ricardo. System of fixing cables and rods subjected to stress. 3,605,202, Cl. 24-122.6

Barry, Robert M., to Multi-Clean Products Incorporated. Floor scrubbing brush. 3,605,347, Cl. 51-330.

Barth, Hermann, to Dilo, Richard. Apparatus for felting non-woven webs. 3,605,223, Cl. 28-4.

Barton, David W.; and Muller, George H., to Ford Motor Company. Resilient bumper assembly for a motor vehicle. 3,606,434, Cl. 293-64.

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Basler, Walter, to Rheometron G.m.b.H., Firma. Measuring the accuracy of flow volume meters. 3,605,481, Cl. 73-3.

Batal, Heinz, to Braun, Carl Camera-Werk. Arrangement for connecting a ski boot to a ski. 3,606,369, Cl. 280-11.35

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Battelle Development Corporation, The: *See—*
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Bauer, Peter, to Bowles Fluidics Corporation. Fluidic control circuit. 3,605,779, Cl. 137-81.5

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Bauman, Joseph F.; Kurtz, Edward, Jr.; and Cini, Adrian V., to Acme-Hamilton Manufacturing Corporation. Flexible corrugated tubing having improved performance characteristics. 3,605,817, Cl. 138-121.

Bayer, Edward C., to Holcroft & Company. Barrel-type batch gas carburizing furnace. 3,606,285, Cl. 263-34.

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Beaty, Gerald A.; and Lynch, Frederick L., to Beaty, Elinore J., and American Cyanamid Company. Illuminated display having remote light source. 3,605,309, Cl. 40-130.

Beaudet, Marcel; and Blais, Cyrille. Aerial ladder. 3,605,943, Cl. 182-67.

Beaudoin, Jean Paul; Hogue, Hiral; and Larocque, Jacques, deceased0 (by Larocque, Patricia Powers; executrix), said Beaudoin and Hogue assors. to Lewis, John, Inc. Stick strip winding machine. 3,605,373, Cl. 53-3.

Becherer, Richard J.; Parrent, George B., Jr.; and Skinner, Thomas J., to Technical Operations, Incorporated. Optical filtering methods and structures for incremetal scanning systems. 3,606,551, Cl. 356-203.

Bechtold, Arthur W., to Chemway Corporation. Bacteriostatic toothbrushes. 3,605,163, Cl. 15-159.

Beck, Earl A., to Garrett Corporation, The. Adjusting means for disc brakes. 3,605,959, Cl. 188-196.

Beck, Roderick G.; Harmon, James F.; Shatila, Mounir A.; Richins, David A.; and Lach, John H., to American Potato Company. French fry potato bodies and method and apparatus for forming such bodies. 3,605,647, Cl. 107-14.

Becker, Karl V., to USM Corporation. Method for stiffening. 3,605,152, Cl. 12-146.

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Beebe, Robert R.; and Murphy, Emmett J., to Marcona Corporation. Method and apparatus for shipping mineral solids and other particulate matter. 3,606,036, Cl. 214-14.

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Bencsics, Odon Steven, to Tamper Inc. Curve liners. 3,605,625, Cl. 104-8.

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Benns, Jack J.: *See—*
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Bentov, Itzhak E., to Medi-Tech Incorporated. Controlled motion devices. 3,605,725, Cl. 128-2.05

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Best, Walter E., to Best Lock Corporation. Cable shackle padlock with plug-retained cable. 3,605,458, Cl. 70-49.

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Betz, George J. Combination spare wheel holder and step for pickup trucks. 3,606,381, Cl. 280-164.

Beuchle, Friedrich Paul; and Depenheuer, Otto, to International Telephone and Telegraph Corporation. Antiskid brake system for vehicles. 3,606,488, Cl. 303-21.

Bielefeldt, Irvin P., to Alco Standard Corporation. Heat treating apparatus for metal workpieces. 3,606,287, Cl. 266-4.

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Binford, Jack C.; Ethridge, Fredrick A.; Talbot, James R.; and Harrison, Deryk W., to Fiber Industries, Inc. Stuffer box crimping and method therefor. 3,605,221, Cl. 28-1.6

Bingle, Gerald L.; Steil, Henry G., Jr.; and Von Essen, Carl A., to Federal-Mogul Corporation. Welded cage process. 3,605,247, Cl. 29-477.

Bion, Jacques, to Societe Anonyme dite: Compagnie des Freins et Signaux Westinghouse. Pressure fluid control valve. 3,606,495, Cl. 303-54.

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Blood, Raymond; and Pearson, Alan John, to Cotton, William, Limited. Straight bar knitting machine fabric draw-off means. 3,605,447, Cl. 66-149.

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Blything, William Charles. Method and apparatus for cutting gears using a gear shaped cutter. 3,605,550, Cl. 90-7.

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Bohner, William R., to ESB Incorporated. Shield. 3,605,115, Cl. 2-10.

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Boucher, Raymond Marcel Gut, to Wave Energy Systems, Inc. Method for increasing visibility through fogs. 3,606,153, Cl. 239-2.

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Bowers, William Stewart. Modular housing structure. 3,605,350, Cl. 52-16.

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Brands, Henry J.; Savage, Joseph W.; and Herzner, Frederick C., to General Electric Company. Cooled shrouded turbine blade. 3,606,574, Cl. 416-96.

Brannan, Leonard M. Method and apparatus for applying dry fertilizer and anhydrous ammonia in a common band. 3,605,657, Cl. 111-7.

Brastow, Edgar R.; Stoer, Raymond A.; and Leitch, John M., to Clary Corporation. Attitude indicating instrument. 3,605,271, Cl. 33-204.

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Brenner, Roy L., to Kinkead Industries Incorporated. Carpet trimming tool. 3,605,267, Cl. 30-287.

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Byers, Orva W. Device for dispensing material from a tube. 3,606,090, Cl. 222-102.

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Campbell, Kyle, to Terrell Machine Company, The. Loop picker for looms and method of forming same. 3,605,820, Cl. 139-159.

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Friedling, Gerard; and Chuard, Marcel. Technicair S.A. Connecting device for fastening together two thin plates in relative angular position. 3,606,415, Cl. 287-189.35

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Jones, Stanley C., to Marathon Oil Company. Imparting in situ stability to displacing fluids. 3,605,895, Cl. 166-273.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Crane Co. : *See*—
Thompson, Bernard B., and O'Connell. Re. 27,168.

General Electric Co. : *See*—
Lass, James L., and Mefford. Re. 27,173.

Grasselli, Robert K., to The Standard Oil Co. Method for the production of certain aromatic and hetero-aromatic aldehydes. Re. 27,171, 9–20–71, Cl. 260—297.

Kent Engineering : *See*—
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Lass, James L., and C. R. Mefford, to General Electric Co. Reactor device. Re. 27,173, 9–20–71, Cl. 176—66.

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Lass, James L., and Mefford. Re. 27,173.

O'Connell, Donald J. : *See*—
Thompson, Bernard B., and O'Connell. Re. 27,168.

Pendergrass, Philip P. : *See*—
Porter, Leslie E. Re. 27,170.

Porter, Leslie E., assignor of a fractional part interest to P. P. Pendergrass. Utility carrier for vehicles. Re. 27,170, 9–20–71, Cl. 224—29.

Standard Oil Co., The : *See*—
Grasselli, Robert K. Re. 27,171.

Thompson, Bernard B., and D. J. O'Connell, deceased, by F. M. O'Connell, administratrix, to Crane Co. Automatic brake control system. Re. 27,168, 9–20–71, Cl. 303—21.

Van Noord, Andrew J., to Kent Engineering. Remote control mirror. Re. 27,172, 9–20–71, Cl. 74—501.

Vinyard, Herbert O. Refuse gathering machine. Re. 27,169, 9–20–71, Cl. 198—7.

CLASSIFICATION OF PATENTS

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